Aboriginal Food Security in Northern Canada: An Assessment of the State of Knowledge

Expert Panel on the State of Knowledge of Food Security in Northern Canada

Council of Canadian Academies
Conseil des académies canadiennes

Science Advice in the Public Interest

ABORIGINAL FOOD SECURITY IN NORTHERN CANADA: AN ASSESSMENT OF THE STATE OF KNOWLEDGE

Expert Panel on the State of Knowledge of Food Security in Northern Canada

THE COUNCIL OF CANADIAN ACADEMIES
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Expert Panel on the State of Knowledge of Food Security in Northern Canada

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Message from the Chair

The importance of food security and its potential impact on both global and local issues cannot be overstated. National and political security, physical and mental health, and community and individual development are some of the factors that influence and are influenced by food security. It is well established that in northern Canada food insecurity is a serious problem that affects the health and wellness of Northerners, with implications for Canada more broadly.

It is for this reason that our Expert Panel was convened to seek evidence on the state of knowledge of the factors influencing food security in the Canadian North, and on the health effects of food insecurity among Canada's northern Aboriginal populations. The Panel embarked on this mission with some trepidation — not because we were daunted by the task assigned to us. Rather, the trepidation resulted from knowing just how much evidence there is from scientific research and documentation, and also from a rich base of traditional knowledge and grey literature that informs the subject, but of which a comprehensive review has never been conducted.

To understand food security in northern Canada, we considered the unique dimensions of northern Canada's vast geography, remote and diverse communities, a cold but shifting climate, and quickly changing economic and social environments — to name a few. While these are all important and complex factors, the human dimension of food security remained at the core of all of the Panel's work. For generations, northern Aboriginal peoples have relied upon traditional knowledge to achieve sustainable livelihoods. The adaptive strategies enacted in response to the rapid and major transitions occurring within northern communities provide further evidence of Northerners' resilience. Moving forward, interventions and policies can be identified, verified, and evaluated. It became clear to us that sustainable solutions to improve food security must be holistic, be enabled by traditional knowledge, respond to locally identified needs, and be paired with economic development strategies. To achieve food sovereignty, support for local food systems is essential. All of these solutions require Northerners to have and continue to establish program ownership.

To those who are familiar with the challenges of achieving food security in northern Canada, the Panel's findings may not be surprising. To these readers, the importance of this report may very well be in its bringing together in one document all the findings related to the state of knowledge about food security and consideration of interventions to improve food security in northern Canada. To Canadians who are unaware of the severity of the situation, the Panel's

findings may indeed be alarming. Further research is critical for surveillance and monitoring of traditional and market food availability, access, utilization, and sustainability, as well as the health status of Northerners.

We know we cannot turn the tide on the nutrition transition, a result of moving away from the predominance of nutrient-rich traditional and country food towards market food. However, health and wellness outcomes can be improved if everyone works together. Addressing food insecurity in the North is a complex challenge that touches on governance and food sovereignty, on poverty and economic development, and on self-determination and education. We hope the Panel has presented its findings in a report that will provide policy-makers, researchers, and, most of all, those individuals and communities affected by food insecurity in the North, with some tools to achieve sustainable and effective solutions.

I take this opportunity on behalf of our Panel to thank Health Canada for their interest in this subject and the Council of Canadian Academies for convening the Expert Panel. Elizabeth Dowdeswell, Council President, and Janet Bax, our Program Director, have ably guided us through the Council's processes and requirements. We were indeed fortunate to have highly qualified staff assistance from Andrea Hopkins as Program Coordinator, and Laura Bennett and Stephanie Meakin as Research Associates.

Harriet V. Kuhnlein, Chair
Expert Panel on the State of Knowledge of Food Security in Northern Canada

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Report Review

This report was reviewed in draft form by the individuals listed below — a group of reviewers selected by the Council of Canadian Academies for their diverse perspectives, areas of expertise, and broad representation of academic, industrial, policy, and non-governmental organizations.

The reviewers assessed the objectivity and quality of the report. Their submissions — which will remain confidential — were considered in full by the Panel, and many of their suggestions were incorporated into the report. They were not asked to endorse the conclusions, nor did they see the final draft of the report before its release. Responsibility for the final content of this report rests entirely with the authoring Panel and the Council.

The Council wishes to thank the following individuals for their review of this report:

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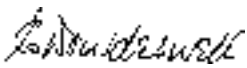
The report review procedure was monitored on behalf of the Council's Board of Governors and Scientific Advisory Committee by **Dr. Sarah P. Otto, FRSC,** Professor and Director of the Biodiversity Research Centre, University of British Columbia (Vancouver, BC). The role of the report review monitor is to ensure that the Panel gives full and fair consideration to the submissions of the report reviewers. The Board of the Council authorizes public release of an expert panel report only after the report review monitor confirms that the Council's report review requirements have been satisfied. The Council thanks Dr. Otto for her diligent contribution as report review monitor.



Elizabeth Dowdeswell, **O.C.**, President and CEO
Council of Canadian Academies

Preface

The issues and concerns surrounding northern food security challenge conventional definitions of expertise and evidence. The Council of Canadian Academies (the Council) was tasked by the Sponsor, Health Canada, to form an expert panel to generate an evidence-based report on northern food security and its implications for Aboriginal health. A multidisciplinary panel of Aboriginal and non-Aboriginal scholars (the Panel) met five times over 15 months to create this report. A draft version was peer-reviewed by 11 experts. Panellists have extensive experience working with Indigenous communities; most have lived and worked in northern communities, and many continue to do so. Council methodology precludes direct stakeholder consultation; however, the Panel sought the cooperation of national Aboriginal organizations and others in its pursuit of evidence. The composition of the Panel and the nature of the evidence incorporated into this report reflect the Council's definitions of expertise and evidence, including an emphasis on volunteered academic expertise and published, peer-reviewed evidence. The scope and emphasis of the report necessarily reflect the Sponsor's charge to the Panel, and the tone reflects the Council's policy of insistence on presenting and summarizing evidence while avoiding advocacy. Thus the Panel and the final report are both products of the constraints under which they were created.

A major finding of the report is the importance of lived, northern experience and traditional knowledge in defining and addressing the issues surrounding northern food security. Although the report emphasizes academic expertise of published, peer-reviewed literature, the direct experience and knowledge of northern peoples are exceedingly important sources of evidence needed to address the issues. Therefore, the lack of a comprehensive review of northern food security derived from the first-hand experience and knowledge of northern peoples is a major knowledge gap identified by the Panel.

Local, regional, national, and international knowledge, experiences, and policies demonstrate that opportunities exist to move Canadians closer to achieving food security and food sovereignty. However, to generate the most sustainable, responsive, and practical solutions, the evidence base must be expanded so that Aboriginal communities, researchers, policy-makers, and Northerners can create sustainable and dignified solutions to the long-standing complex challenge of food insecurity among Aboriginal peoples in the North.

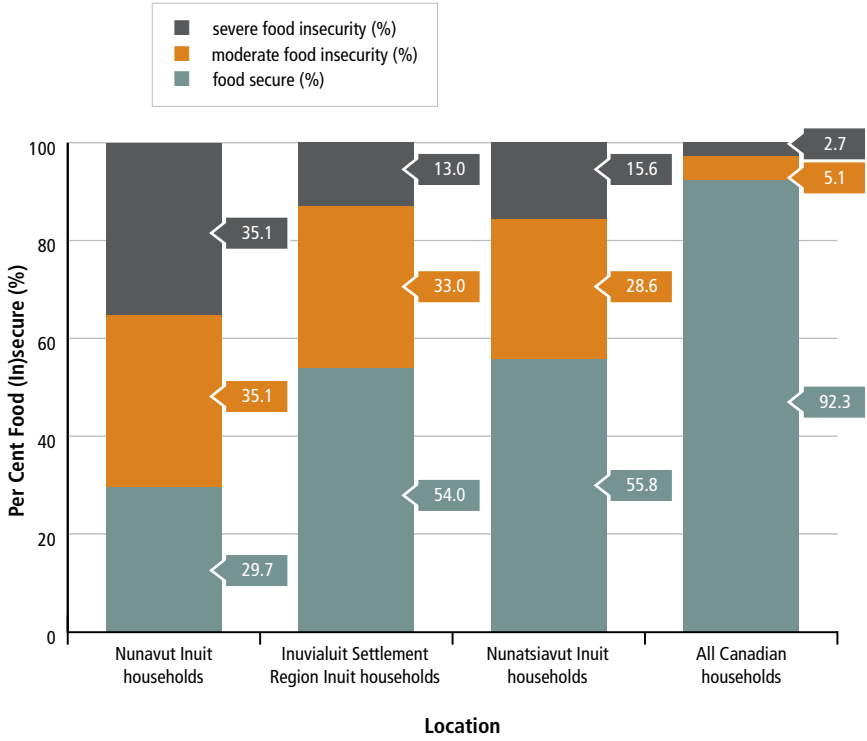
Executive Summary

As the world's population increases, as global markets become more interconnected, and as the effects of climate change become clearer, the issue of food insecurity is gaining traction at local, national, and international levels. The recent global economic crisis and increased food prices have drawn attention to the urgent situation of the world's 870 million chronically undernourished people who face the number one worldwide risk to health: hunger and malnutrition. Although about 75% of the world's undernourished people live in low-income, rural regions of developing countries, hunger is also an issue in Canada. In 2011, 1.6 million Canadian households, or slightly more than 12%, experienced some level of food insecurity. About one in eight households are affected, including 3.9 million individuals. Of these, 1.1 million are children.

Food insecurity presents a particularly serious and growing challenge in Canada's northern and remote Aboriginal communities (see Figure 1). Evidence from a variety of sources concludes that food insecurity among northern Aboriginal peoples is a problem that requires urgent attention to address and mitigate the serious impacts it has on health and well-being. Results from the 2007–2008 International Polar Year Inuit Health Survey indicate that Nunavut has the highest documented rate of food insecurity for any Indigenous population living in a developed country. According to estimates from the 2011 Canadian Community Health Survey (CCHS), off-reserve Aboriginal households across Canada experience food insecurity at a rate that is more than double that of all Canadian households (27%). Recent data indicate that Canadian households with children have a higher prevalence of food insecurity than households without children, and preliminary evidence indicates that more women than men are affected.

Box 1
Food Security and Food Insecurity

As proposed by the FAO Committee on World Food Security in 2013, the most current definition of food security has been expanded to emphasize the importance of nutrition. Food and nutrition security exist "when all people at all times have physical, social and economic access to food, which is safe and consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life." Food insecurity is the converse. It is an outcome of inadequate or uncertain access to an acceptable amount and quality of healthy food.



Data Source: Egeland, 2010a, 2010b, 2010c; Health Canada, 2008

Figure 1

Prevalence of Household Food Insecurity Across Northern Regions and Canada, 2007–2008

Data show food insecurity among Inuit households in Nunavut, the Inuvialuit Settlement Region, and Nunatsiavut (data from IPY Inuit Health Survey using a modified Household Food Security Survey Module (HFSSM) survey tool as presented in Egeland, 2010a, 2010b, 2010c), as well as food insecurity among all Canadian households in 2007–2008 (data from Canadian Community Health Survey, 2007–2008 using the HFSSM survey tool as presented in Health Canada, 2008). Proportions are shown within the bars (numbers may not add due to rounding). Nunavik Inuit Health Survey and First Nations Regional Health Survey results are not included because they used a different methodology to collect the data (i.e., different questions were asked), rendering the data unfit for direct comparisons.

CHARGE TO THE PANEL

Much remains unknown about the complex factors that influence food security in northern Canada, as well as the health implications of this challenge. To better understand these issues, in October 2011 the Minister of Health, on behalf of Health Canada (the Sponsor), asked the Council of Canadian Academies (the Council) to appoint an expert panel (the Panel) to respond to the following question:

What is the state of knowledge of the factors influencing food security in the Canadian North and the health implications of food insecurity for Northern Aboriginal populations?

In addition, the Sponsor asked five sub-questions:

1. *How are social, environmental, economic, and cultural factors impacting food security, and the subsequent health of Northern Aboriginal populations? Considering the interaction among these factors, what are the knowledge gaps associated with enablers and barriers to food security?*

2. *What are the current knowledge gaps in food security as a determinant of health for Northern Aboriginal populations, particularly in the areas of nutrition and environmental health? What are these knowledge gaps in the context of store-bought and country food? What is known about the relationship between country/traditional food and food security, for example, the use and importance of traditional foods, harvesting practices and resources to support these, food sharing systems, marketing systems, and their contribution to food security among Northern Aboriginal populations? What are effective ways to promote country/traditional food consumption, especially among youth, taking into consideration nutrition education, skills development and approaches to knowledge exchange (e.g., intergenerational; use of technologies)?*

3. *What is known about the evidence base that informs strategies to mitigate food insecurity among Northern Aboriginal populations? What can be learned from strategies implemented by other circumpolar countries, such as Greenland?*

4. *What contribution are traditional knowledge networks of Northern Aboriginal communities making to food security research?*

5. *What are the international approaches to developing scientific evidence and knowledge systems in support of interventions to mitigate food insecurity among northern Aboriginal populations?*

A multidisciplinary panel of Aboriginal and non-Aboriginal scholars met five times over 15 months to create this report, which was peer-reviewed by 11 experts. While the direct experience and knowledge of northern peoples are exceedingly important forms of evidence needed to identify and address northern food security issues, Council methodology precludes direct stakeholder consultation. However, the Panel sought cooperation of national Aboriginal

organizations and others to gather additional evidence. Volunteered academic expertise, published, peer-reviewed literature, and credible grey literature formed the basis of scholarship and evidence for this report.

PANEL'S APPROACH TO THE ASSESSMENT

While food insecurity is not a new problem, the ways in which it is currently experienced in northern Canada are highly contemporary. Processes of colonialism and environmental dispossession, rapid and sometimes unpredictable environmental change, economic transitions and material poverty, changing demographics, and current logistical challenges are some of the factors that shape this modern version of food insecurity. Food safety issues, changing food knowledge and preferences, and the extent to which intergenerational knowledge transmission and self-determination are practiced represent other factors that affect contemporary food security. Alone, these factors are complex. This complexity is heightened in consideration of how the factors connect with one another, and, of course, with people. To create appropriate and effective policy and program responses, the Panel agreed that it was critical to identify the level and scope of food (in)security; individual, household, community, regional, and national contexts necessitate different types of analysis and engagement.

With this in mind, the Panel chose to take a holistic approach to the assessment. It developed a people-centred framework that highlights the dynamic interplay between northern Aboriginal peoples and the diverse factors that affect their lives (see Figure 2). Rather than being understood as discrete entities, the concepts of food security and food sovereignty emerge from the inter-relationships of the multiple factors and themes in the framework. The framework conveys the breadth and complexity of the factors that the Panel deemed necessary to respond to the charge, while also providing insight into (a) the relationships that emerge at the intersections of the factors, and (b) the various factors that are important considerations in strategies to mitigate food insecurity. Each factor presented in the framework was considered in the report; some understandings and linkages remain clearer than others.

The complexity of the interactions of all these factors and themes points to the need for multidisciplinary approaches to understanding and resolving the issues. The Panel envisioned this framework as a tool to be used by policy-makers, researchers, and individuals and communities affected by food insecurity in the North to analyze food (in)security at the level that is most meaningful to them, and to achieve sustainable and effective solutions.

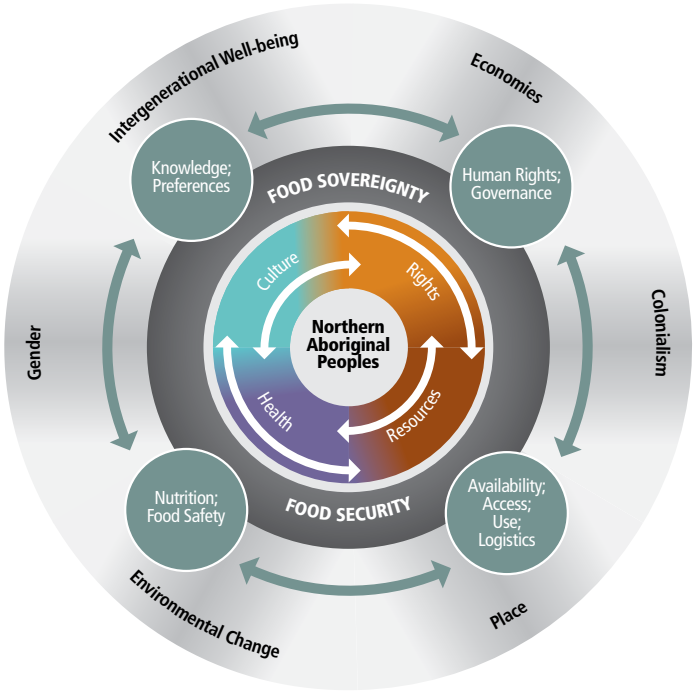


Figure 2

The Panel's Conceptual Framework

The Panel developed this dynamic, holistic, people-centred framework as a tool for analyzing and understanding food security and food sovereignty in northern Canada. The wheel represents the complex interplay between factors that affect northern Aboriginal peoples, and how food security and food sovereignty emerge from these relationships. Because the framework is fluid, no single factor should be interpreted as static or merely linked to the factor to which it is most closely positioned. Each factor is understood to have multiple relationships with other concepts within the wheel. The framework conveys the complexity of the factors that the Panel deemed necessary to respond to the charge, while also providing insight into (a) the relationships that emerge from these connections, and (b) the diverse factors that are important considerations in strategies to mitigate food insecurity.

FOOD SECURITY AND FOOD SOVEREIGNTY

Using traditional knowledge throughout times of abundance and scarcity, Aboriginal peoples of northern Canada have developed and adapted dynamic relationships with the environments in which they live. These relationships include shifting practices of harvesting spiritually and nutritionally valuable native plant and animal wildlife species known locally as *country* or *traditional* food. The harvesting of food from the land, water, and sky continues to be a necessary and important part of the lives and identity of the many diverse

peoples known in Canada as First Nations, Inuit, and Métis. With this in mind, the Panel highlighted the importance of pairing the concept of food security with that of food sovereignty, as demonstrated in the conceptual framework. While food security focuses on the pillars of food access, availability, acceptability, adequacy, and use to ensure that all people at all times have physical, social and economic access to food, food sovereignty is based on the principle that decisions about food systems, including markets, production modes, food cultures, and environments, should be made by those who depend on them. Support for autonomous community food systems, community-based research, and community-based solutions that respond to locally identified needs emerged as essential steps towards meeting the goal of sustainable and local food self-sufficiency.

HEALTH IMPLICATIONS OF FOOD INSECURITY

The Panel agreed that health and wellness can be an enabler of food security, as well as an outcome of being food secure. Conversely, poor health can be a barrier to food security and an outcome of being food insecure. While Aboriginal health is understood holistically in this report, comprising mental, physical, spiritual, emotional, and social dimensions, Aboriginal peoples' basic health status measures and conditions tend to be worse than those of Canadians in general. Compared with most Canadians, Aboriginal populations have higher acute myocardial infarction mortality, higher rates of obesity and other risk factors for heart diseases, and higher rates of mental health problems such as suicide, depression, and substance abuse. Diabetes has reached epidemic proportions in some Aboriginal communities, and First Nations, Métis, and Inuit recount lower levels of self-reported health compared with the general population. The nutrition transition, a result of moving away from nutrient-rich traditional and country food-based diets towards ones based on market food, may increase the risk for diet-sensitive chronic diseases and micronutrient deficiencies in northern Aboriginal communities.

Evidence indicates that people who are food insecure are more susceptible to malnutrition and infection, as well as chronic health problems such as obesity, anemia, cardiovascular disease, diabetes, stress, and child developmental issues. Mental health effects of food insecurity include reduced ability to learn, depression, and social exclusion. The Panel concluded that the toll of food insecurity on human well-being and the economic costs of an emerging public health crisis in northern Canada represent serious concerns that require immediate attention and integrated responses.

KNOWLEDGE GAPS

While much is generally known about the factors influencing food security in the Canadian North and the health implications of food insecurity for northern Aboriginal populations, significant gaps remain. For example, a rich base of traditional knowledge and grey literature informs the subject, but a comprehensive review of contributions derived from first-hand experience and knowledge of northern peoples has yet to be conducted. Through a synthesis of the existing literature, the Panel identified several priority areas for further investigation, including:

- research and monitoring methodologies;
- health, wellness, and nutrition transition;
- social determinants of food security;
- the supply chain costs of market food systems;
- climate change, the environment, and traditional/country food systems;
- food sovereignty and governance; and
- food security and knowledge translation.

Data gaps limit the extent to which researchers, communities, and policy-makers can report on and monitor food security and health indicators. Ultimately, these gaps have implications for outcome measures. Beyond obtaining data sets that are comparable in quantity and quality to those available for the majority of the Canadian population, there is a need to adapt data collection tools and standards to the varied realities of Aboriginal peoples in Canada. A consistent and relevant understanding of the situation across different communities of Aboriginal peoples, including variables such as region, gender, age, and season, is important in the delivery of evidence-based public policy.

LEARNING FROM TRADITIONAL KNOWLEDGE AND WESTERN KNOWLEDGE SYSTEMS

Traditional knowledge represents a way of life, but traditional knowledge of the local environment, combined with the related skill sets for harvesting, travelling on the land and water, and food processing, can also be understood as a set of cultural practices necessary for food security and food sovereignty. The extent to which this knowledge is transmitted to future generations plays an important role in determining the health and wellness of individuals and communities. Traditional knowledge has always guided the lives of northern Aboriginal peoples, and a growing number of Canadian and international community-based programs and participatory research projects are making valuable contributions to food security research. Several Indigenous knowledge centres, networks, programs, community-based research hubs, centres for northern research, and food security organizations actively promote the

integration of traditional knowledge and Western science into northern food security research. These channels, such as Food Secure Canada's Northern and Remote Food Network, the Arctic Institute of Community Based Research (YT), the Qaujigiartiit Health Research Centre (NU), and the Nain Research Centre (NL) are important resources for current and future research and policy development related to food security and northern Aboriginal peoples.

PROMISING PRACTICES TO BUILD FOOD SECURITY, FOOD SOVEREIGNTY, HEALTH, AND WELLNESS

Short- and Long-Term Approaches

Because food insecurity is experienced differently at individual, household, community, and regional levels, it follows that strategies to mitigate food insecurity must be similarly diverse. A continuum of programs and policies must be used to address food insecurity, ranging from short-term mitigation (temporary solutions such as food banks and children's feeding programs) to capacity building and skills development programs (e.g., community gardens and cooperative buying clubs), to long-term organizational change and policy responses that focus on root causes (e.g., food policy networks and food system interventions).

Multi-Level Approaches and Inter-Sectoral Collaboration

Declining harvests of plant and animal wildlife species, increased imports and consumption of store-bought food, and the discovery of environmental contaminants in traditional and country food have inspired Aboriginal people, communities, researchers, and governments to action. Grassroots efforts to improve Aboriginal peoples' health and wellness include community-led food assessments such as *NiKigijavut Hopedalimi* in Hopedale, Labrador; resistance to poverty and high food prices through Iqaluit-based Feeding My Family; and the national movement Idle No More, which aims to peacefully honour Indigenous sovereignty and rights and to protect the land and water. At provincial and territorial levels, Manitoba's *Northern Healthy Foods Initiative* aims to build food security and food sovereignty in northern and remote Manitoba communities, and in Nunavut local, territorial, and corporate stakeholders from across the North have collaborated to draft the Nunavut Food Security Strategy. Health Canada's Aboriginal Diabetes Initiative, the Canada Prenatal Nutrition Program, and Nutrition North Canada represent steps taken at the national level. The Panel concluded that a continuum of multi-level approaches based on inter-sectoral collaboration among communities, local agencies, government, and institutions is important for successful and sustainable initiatives.

Multidisciplinary Approaches

While each of these initiatives is important, no single response can solve the problem of food insecurity. Nutrition education programs are valuable, but they cannot compensate for poor access to food, for example. In addition to multi-level approaches, multidisciplinary responses are critical to building food security and food sovereignty. The Panel grouped a selection of strategies into seven categories:

- programs to increase the affordability and availability of healthy food (e.g., Growing Forward, MB);
- health and education (e.g., Nunavut Food Guide Recipe Program);
- community wellness and intergenerational knowledge sharing (e.g., *Ilisaqsivik*, NU);
- harvester support and sustainable wildlife management (e.g., *Eeyou Astchee*[1], QC);
- poverty reduction and community economic development (e.g., Bayline Northern Food Security Partnership, MB);
- innovation in infrastructure and local food production (e.g., Northern Farm Training Institute, NT); and,
- youth engagement (e.g., Going Off, Growing Strong, NL).

Moving Forward

The capacity exists to identify, verify, and evaluate interventions. Relevant and effective responses to improve food security and food sovereignty must be holistic, enabled by local traditional knowledge, and paired with economic development strategies to tackle the closely connected issue of poverty. Long-term alleviation of food insecurity requires clarification of locally identified needs and drawing on the assets of distinct northern communities. Stable funding is also a key factor. All of these solutions require Northerners to establish program ownership. However, it remains important to look beyond individual food decisions and consider how society, including the unique historical context of Aboriginal people in Canada, configures opportunities such that some have more choices than others.

FINAL REFLECTIONS

A strong, multidisciplinary body of knowledge exists on food security and northern Aboriginal health. Scholarship, including coordinated and community-based research programs, has answered many important questions. Some of the major contributions of this report include the synthesis of these findings, consideration of interventions to improve food security in northern Canada, and development of a tool for community members and policy-makers in the form of a conceptual framework. While the report does not provide policy

1 Also spelled *Eeyou Istchee*

prescriptions, the Panel hopes the findings will contribute to evidence-based policies and programs, increased cooperation and coordination of northern research agendas among stakeholders, and, ultimately, improvements in the health and well-being of northern Aboriginal peoples.

Canada has the capacity to address the critical issue of food insecurity as experienced disproportionately by northern Aboriginal peoples. There are clear opportunities towards achievement of food security and food sovereignty by using existing local, regional, national, and international knowledge, experiences, and policies, as well as in expanding the evidence base so that Aboriginal communities, researchers, policy-makers, and Northerners can create sustainable and dignified solutions to the long-standing complex challenge of food insecurity among Aboriginal peoples in the North. Public health is a collective responsibility. Canada and Canadians hold many of the essential tools required to tackle this serious and substantial public health challenge, and to create the conditions for social and economic prosperity.

Glossary

Aboriginal people

Aboriginal people refers to all the Aboriginal people in Canada collectively. The Canadian Constitution recognizes three groups of Aboriginal people: Indians (First Nations), Métis, and Inuit. They are three separate peoples with unique heritages, languages, cultural practices, and spiritual beliefs. The term *Aboriginal people* may also be used when referring to more than one Aboriginal person (AANDC, 2004). Please see also the entry for *Indigenous people(s)*.

Aboriginal peoples

Aboriginal peoples is a collective name for the original peoples of North America and their descendants. The "s" emphasizes the diversity of people within the group known as Aboriginal people (AANDC, 2004).

Acceptability

In this report and related discussions, *acceptability* denotes culturally acceptable and appropriate food and distribution systems (Myers *et al.*, 2004).

Access

For this report and related discussions, *access* refers to adequate resources for acquiring appropriate foods for a nutritious diet (FAO, 2006) for all people at all times (Myers *et al.*, 2004).

Adequacy

For this report and related discussions, *adequacy* refers to the nutritional quality, safety, and sustainability of available sources and methods of food supply (Myers *et al.*, 2004).

Agency

For this report and related discussions, *agency* refers to policies and processes enabling the achievement of food security (RCSFS, 2012).

Availability

For this report and related discussions, *availability* denotes sufficient quantities of food of appropriate quality (FAO, 2006) for all people at all times (Myers *et al.*, 2004).

First Nations

First Nations people are one of three cultural groups recognized as Aboriginal peoples in Canada. The term *First Nations* came into usage in the 1970s to replace the word Indian in common speech. The Panel chose to use *First Nations* instead of *Indian* throughout this report. Although the term is widely used, no legal definition of *First Nations* exists. There are legal reasons for the continued use of the term *Indian* (AANDC, 2004).

First people(s)

First people(s) is another collective term used to describe the original inhabitants of Canada or North America, along with their descendants (AANDC, 2004).

Food insecurity

Food insecurity is the converse of food security. It is an outcome of inadequate or uncertain access to an acceptable amount and quality of healthy food. It refers to the immediate inability to secure an adequate diet, as well as the risk of being unable to do so in the future.

Food security

Food security "exists when all people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996, rev. 2009). It is based on the various pillars of access, availability, use, stability, acceptability, adequacy, and/or agency (Myers *et al*., 2004; FAO, 2006; RCSFS, 2012).

Food sovereignty

Food sovereignty can be understood as the ability and the right of people "to define their own policies and strategies for sustainable production, distribution and consumption of food that guarantee the right to food for the entire population" (WFFS, 2001).

Harvesting

Harvesting means "the reduction of wildlife into possession, and includes hunting, trapping, fishing […] netting, egging, picking, collecting, gathering, spearing, killing, capturing or taking by any means" (DIAND & the Tunngavik, 1993). Harvesting is the way in which traditional/country food is directly obtained from nature.

Health and wellness

In this report, *health and wellness* are conceptualized as holistic. This approach is rooted in Indigenous ways of knowing and being, and represents a significant step beyond an understanding of health as narrowly conceived as a matter of biomedical cause and effect, or lifestyle choices (NCCAH, 2012). According to the National Aboriginal Health Organization (NAHO), "First Nations, Inuit and Métis concepts of health incorporate the mental, physical, spiritual, emotional, and social aspects of health. Furthermore, the health and well-being of individuals and communities are interdependent and equally important" (NAHO, 2007).

Indigenous people(s)

The meaning of *Indigenous peoples* is similar to *Aboriginal peoples* or *First peoples*. It is often used to refer to Aboriginal people internationally, denoting a collective history regardless of borders. Meaning "originating or occurring naturally in a particular place," many agree that the word *Indigenous* also connotes the relationships that peoples have with their traditional territories, and that it is more uniting and less colonizing than the term *Aboriginal* (King & CIHR-IAPH, 2013).

Inuit

Inuit are an Aboriginal people in northern Canada from the main regions of Nunavut, Northwest Territories, northern Quebec (Nunavik), and northern Labrador (Nunatsiavut). The word means *people* in a major Inuit language (Inuktitut). The singular of *Inuit* is *Inuk* (AANDC, 2004).

Inuit Nunangat

Inuit Nunangat is composed of the Inuvialuit Settlement Region, Nunavut, Nunavik, and Nunatsiavut. It is the area of land, water, and ice that comprises the traditional Inuit homeland in Canada (ITK, n.d.).

Inuvialuit Settlement Region (ISR)

The *Inuvialuit Settlement Region* (ISR) was created by a land claims agreement in 1984 and is home to the Inuvialuit (AAIR, n.d.). The ISR covers approximately 435,000 square kilometres in the Mackenzie Delta, Beaufort Sea, and Amundsen Gulf area in the Northwest Territories and Yukon.

Land claims

In 1973, the federal government recognized two broad classes of claims — comprehensive and specific. Comprehensive claims are based on the assessment that there may be continuing Aboriginal rights to lands and natural resources. These kinds of claims come up in those parts of Canada where Aboriginal title has not previously been dealt with by treaty and other legal means; they are called *comprehensive* because of their wide scope and include such things as land title, fishing and trapping rights, and financial compensation. Specific claims deal with particular grievances that First Nations may have regarding the fulfilment of treaties. Specific claims also cover grievances relating to the administration of First Nations lands and assets under the *Indian Act* (AANDC, 2004).

Market gardens

The term *market gardens* refers to small or large plots of land used by an individual or community to produce locally grown foodstuffs (vegetables, fruit, and small animals) for local sale and personal consumption.

Métis

Métis are an Aboriginal people of mixed First Nations and European ancestry who identify themselves as Métis, as distinct from First Nations people, Inuit, or non-Aboriginal people. The Métis have a unique culture that draws on their diverse ancestral origins, such as Scottish, French, Ojibwa, and Cree (AANDC, 2004).

Northern Aboriginal people(s)

This term refers to the Aboriginal people(s) living in northern Canada (as defined below).

Northern Canada

For this report, *northern Canada* refers to the land and ocean-based territory that lies north of the southern limit of discontinuous permafrost from northern British Columbia to northern Labrador. In some cases, however, the portion of northern Canada served by the Nutrition North Canada program is emphasized.

Nunatsiavut

Nunatsiavut is an Inutitut word that means "our beautiful land." This autonomous area in Newfoundland and Labrador is the home of the Labrador Inuit (NG, 2009).

Nunavik

Meaning "great land" in Inuktitut, Nunavik is home to the *Nunavimmiut* of northern Quebec (north of the 55th parallel). Negotiations for regional autonomy are underway.

Nutrition security

According to the Food and Agriculture Organization of the United Nations (FAO, *et al*., 2012), *nutrition security* exists "when secure access to an appropriately nutritious diet is coupled with a sanitary environment, adequate health services and care, in order to ensure a healthy and active life for all household members. Nutrition security differs from food security in that it also considers the aspects of adequate caring practices, health and hygiene in addition to dietary adequacy."

Nutrition transition

Nutrition transition describes the impact on nutritional status as a result of consumption of more market-based food than traditional/country food.

Off-reserve

This term describes people, services, or objects not part of a reserve but still related to First Nations (AANDC, 2004).

On the land

This term refers to Aboriginal people spending time away from towns, villages, and hamlets to hunt, fish, gather, and so forth.

Reserve

A *reserve* is a tract of land, the legal title to which is held by the Crown, set apart for the use and benefit of an Indian band (AANDC, 2004).

Stability

Stability refers to access to adequate food at all times, i.e., not at risk of losing access to food as a consequence of sudden shocks (e.g., an economic or climatic crisis) or cyclical events (e.g., seasonal food insecurity) (FAO, 2006).

Traditional knowledge

Traditional knowledge includes knowledge from the distant and recent past, knowledge that is being acquired today, and knowledge that will be acquired in the future (ITK, 2012). It is both a way of life and a systematic way of thinking applied to phenomena across biological, physical, cultural, and spiritual systems important to maintaining culture, livelihoods, and well-being (McGregor, 2004; Berkes, 2008; Tagalik, 2010).

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Frequently Used Abbreviations and Acronyms

AANDC	Aboriginal Affairs and Northern Development Canada
AMAP	Arctic Monitoring and Assessment Programme
CCHS	Canadian Community Health Survey
CFS	Committee on World Food Security
CIHR	Canadian Institutes of Health Research
FAO	Food and Agriculture Organization of the United Nations
HFSSM	Household Food Security Survey Module
HFTA	Hunters, Fishers, and Trappers Association
HSP	Hunter Support Program
HTA	Hunters and Trappers Association
HTO	Hunters and Trappers Organization
IHS	Inuit Health Survey
IPY	International Polar Year
ISR	Inuvialuit Settlement Region
ITK	Inuit Tapiriit Kanatami
JBNQA	James Bay and Northern Quebec Agreement
LIM	Low Income Measure
NAHO	National Aboriginal Health Organization
NHS	National Household Survey (Canada)
NWT	Northwest Territories
PCBs	Polychlorinated Biphenyls
POPs	Persistent Organic Pollutants
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples

1

Introduction

- Charge to the Panel
- Intent of the Report
- Food Security, the Right to Food, and the Emergence of Food Sovereignty
- Structure of the Report

1 Introduction

Key Messages

Food insecurity is a serious problem in Canada and particularly critical for northern and remote Aboriginal communities. It is caused by many factors and has far-reaching social, public health, environmental, and economic implications for the North and the rest of Canada. Its prevalence coincides with considerable health and social disparities between Aboriginal people and the general Canadian population.

The concept of food security is complex, and requires consideration of a much broader range of aspects than simply access to food.

Food security is a growing concern globally, and Canada has commitments to food security under numerous international agreements.

Food sovereignty, people's ability to define their own food systems, represents a compelling means by which to achieve food security. The concepts of food security and food sovereignty are critical to this report.

Northern regions in Canada are simultaneously experiencing transformation and gains in global economic and geopolitical importance. This rapid and often unpredictable change is not only linked to environmental change but also to how northern communities engage with, and are affected by, the opportunities and challenges that new economic prospects continue to bring. As changes continue to impact northern ecosystems and communities — notably, climate change and industrial development — northern Canada, as well as the circumpolar region more globally, has become increasingly prominent in government agendas, media reports, and the public consciousness. As a dimension of northern sovereignty and human and environmental security, the food security of northern Aboriginal peoples is integral to this discussion at both the community and government levels (Box 1.1). Due to the consequences of human and environmental stress on northern ecosystems, northern regions are being forced to address food security concerns sooner than many other parts of Canada and the world (GRID-Arendal, 2009). This discussion is expected to intensify as Canada continues to chair the Arctic Council (2013–2015).

Northern Aboriginal peoples' governance is central to discussions of northern sovereignty and development. For thousands of years, using traditional knowledge in times of abundance and scarcity, Aboriginal peoples of northern Canada have

Box 1.1
Food Insecurity: From Global to Local

As the world's population increases, as global markets become more interconnected, and as the effects of climate change become clearer, food security issues are gaining traction at the local, national, and international levels. The recent global economic crisis and higher food prices have drawn attention to the urgent situation of the world's 870 million chronically undernourished people (FAO *et al.*, 2012) who face the number one worldwide risk to health: hunger and malnutrition (WFP, 2012a). Although about 75% of the world's undernourished people live in low-income, rural regions of developing countries (WFP, 2012b), hunger is also an issue in Canada. As the United Nations (UN) Special Rapporteur on the Right to Food highlighted during a visit to Canada in the spring of 2012, a growing number of Canadians are unable to meet their basic food needs, despite Canada being a Group of Eight (G8) country often at the forefront of the UN Human Development Index (UNOHCHR, 2012). The UN Special Rapporteur directed particular attention to the food insecurity of Aboriginal people in Canada, as well as to food security considerations for rural and remote communities across the country — especially in the North.

developed and adapted dynamic relationships with the environments in which they live. These relationships include shifting practices of harvesting native plant and animal wildlife species known locally as "country" or "traditional" food (Gerlach & Loring, 2013; Kuhnlein & Receveur, 1996). Traditional/country food is an important contributor to food security and health in the North, with significant spiritual and nutritional value. The harvesting of food from the land, water, and sky continues to be necessary and important to the lives and identities of the many diverse peoples known in Canada as First Nations, Inuit, and Métis.

However, the well-being of Aboriginal peoples has been seriously and negatively impacted by processes of colonialism, which have led to the dispossession of traditional lands and resources (Loppie Reading & Wien, 2009). Systematic disempowerment has occurred through various assimilationist policies, including forced residential schooling and relocation to distant communities, which have not only denied Aboriginal peoples access to the lands and resources of their traditional territories, but have also forbidden the practice of many land-based activities central to their ways of life, cultural identities, and overall health and well-being. The trauma of abuse, dislocation, and cultural assimilation has intergenerational consequences, many of which have critically impacted the social and cultural fabric of Aboriginal communities' identities (Richmond &

Ross, 2009; Borrows, 2010). These continuing and unresolved traumas have clear implications for intergenerational knowledge transmission and local environmental knowledge in Aboriginal communities today. Despite, and because of, these challenges, however, Aboriginal people across Canada continue to demonstrate their resilience and desire for sustainable livelihoods for future generations. Recent examples include the initiation of Idle No More, a national movement to peacefully honour Indigenous sovereignty and rights and to protect the land and water; resistance to poverty and high food prices across the North through the Iqaluit-based group Feeding My Family; and localized, grassroots action in communities across the country in response to environmental and cultural threats.

Declining harvests of plant and animal wildlife species, increased imports and consumption of store-bought food, and the discovery of environmental contaminants in traditional/country food have propelled Aboriginal people, communities, researchers, and governments to action. As the UN Special Rapporteur on the Right to Food highlighted during his visit to Canada in 2012, research consistently identifies food insecurity as a serious problem experienced by northern Aboriginal peoples. According to estimates from the 2011 Canadian Community Health Survey (CCHS), off-reserve Aboriginal households across Canada experience food insecurity at a rate that is more than double that of non-Aboriginal households (Tarasuk *et al.*, 2013). Food insecurity is particularly pronounced in the remote North, where a high proportion of Inuit live. According to the 2007–2008 International Polar Year Inuit Health Survey, 44.2% of Inuit households in Nunatsiavut, 46.0% in the Inuvialuit Settlement Region (ISR), and 70.2% in Nunavut experienced moderate to severe food insecurity[2] (Egeland, 2010b, 2010a, 2010c).

Furthermore, the unique food systems of northern Aboriginal peoples, characterized by a mixed diet of harvested food from the land (traditional/country food) and imported food sold in stores (market food), pose unique considerations for understanding food security and health, along with the necessary considerations of climate change, exposure to contaminants, and intergenerational well-being. Many initiatives have addressed the food insecurity of northern Aboriginal peoples, including federal food mail programs (from the 1960s to 2011), food subsidy programs such as Nutrition North Canada

2 In this case, "food insecure" refers to measures of moderate and severe food insecurity. Moderate food insecurity is defined as households with "indication of compromise in quality and/or quantity of food consumed," while severe food insecurity is defined as households with "indication of reduced food intake and disrupted eating patterns" (ONPP, 2007). The Inuit Health Survey used a questionnaire that was originally developed by the United States Department of Agriculture, and then modified by Indian and Northern Affairs Canada (Egeland, 2010a; 2010b; 2010c).

(from 2011 to the present), educational initiatives, nutritional interventions, and hunter support programs. However, a more comprehensive effort aimed at adequately understanding the range of contributing factors is absent.

Since the mid-1990s, researchers working with Aboriginal peoples in the Arctic North have recognized food security as an issue of central importance requiring urgent study (Duhaime & Bernard, 2008). A major multidisciplinary circumpolar research study on this topic was undertaken from 1998 to 2003 by a panel of international experts (Duhaime & Bernard, 2008). Although an abundance of literature and coordinated research programs have answered important questions about factors affecting food security, many questions still remain. Even 10 years after the major study's conclusion, trends indicated that the prominence of food security concerns would continue to grow. This hastens the continuing and urgent need for multi-level and cooperative research and policy responses (GRID-Arendal, 2009). Both Western and traditional knowledge systems are paramount to understanding the complexity of food security and health issues, and to developing culturally appropriate and effective response strategies. A research agenda that seeks to identify and fill gaps in the evidence on food security and health is essential, especially at a time when national and international research activities are expanding in the North. Understanding the causes and effects of food security and its converse, food insecurity, is difficult due to the multidimensional nature of the local, regional, national, and global factors involved in food access, availability, stability, and use. Further, the situations of individual communities must be considered in any analysis of food security, especially in a region as geographically and culturally diverse as northern Canada.

Finally, research efforts must remain conscious of the historical context of research in Canada. Previously, government assimilation policies for Aboriginal people contributed to research conditions that sometimes violated what we now know as the *International Ethical Guidelines for Biomedical Research Involving Human Subjects* and other ethical guidelines for research involving or affecting vulnerable or potentially vulnerable groups or persons (Mosby, 2013). In response to research practices that caused harm or brought no benefits to Aboriginal communities and individuals, several guidelines were put in place, such as the *Ethical Principles for the Conduct of Research in the North* (ACUNS, 2003) in 1982, the *Principles for the Conduct of Research in the Arctic* (NSF, 1990), and *Negotiating Research Relationships with Inuit Communities: A Guide for Researchers* (ITK & NRI, 2007). The updated *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (CIHR *et al.,* 2010), which governs research under the three granting councils that provide funding to researchers and institutions

in Canada,[3] has set a new, mandatory national standard for research involving Aboriginal peoples. While it is not intended to replace ethical guidance offered by Aboriginal peoples themselves, it aims to ensure that research is premised on respectful relationships. The Tri-Council notes that this "marks a step toward establishing an ethical space for dialogue on common interests and points of difference between researchers and Aboriginal communities engaged in research" (CIHR *et al.*, 2010).

1.1 CHARGE TO THE PANEL

Health Canada, along with its portfolio partners at the Canadian Institutes of Health Research and the Public Health Agency of Canada, and other federal departments such as Aboriginal Affairs and Northern Development Canada and Environment Canada, administers several programs and conducts a range of activities related to food security in the North. To effectively contribute to food security for healthy northern Aboriginal peoples and communities, a coordinated and updated evidence base is required. With this in mind, in October 2011, the Minister of Health, on behalf of Health Canada (the Sponsor), asked the Council of Canadian Academies (the Council) to appoint an expert panel (the Panel) to respond to the following main question:

> *What is the state of knowledge of the factors influencing food security in the Canadian North and the health[4] implications of food insecurity for Northern Aboriginal populations?*

In addition, the Sponsor asked five sub-questions:

1. *How are social, environmental, economic, and cultural factors impacting food security, and the subsequent health of Northern Aboriginal populations? Considering the interaction among these factors, what are the knowledge gaps associated with enablers and barriers to food security?*

2. *What are the current knowledge gaps in food security as a determinant of health for Northern Aboriginal populations, particularly in the areas of nutrition and environmental health? What are these knowledge gaps in the context of store-bought and country food? What is known about the relationship between country/traditional food and food security, for example, the use and importance of traditional foods, harvesting practices and resources to support*

3 Including the Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council of Canada, and the Social Sciences and Humanities Research Council.

4 Health in this context refers to a broad definition that includes social, mental, physical, spiritual, economic, and cultural well-being.

these, food sharing systems, marketing systems, and their contribution to food security among Northern Aboriginal populations? What are effective ways to promote country/traditional food consumption, especially among youth, taking into consideration nutrition education, skills development and approaches to knowledge exchange (e.g., intergenerational; use of technologies)?

3. *What is known about the evidence base that informs strategies to mitigate food insecurity among Northern Aboriginal populations? What can be learned from strategies implemented by other circumpolar countries, such as Greenland?*

4. *What contribution are traditional knowledge networks of Northern Aboriginal communities making to food security research?*

5. *What are the international approaches to developing scientific evidence and knowledge systems in support of interventions to mitigate food insecurity among northern Aboriginal populations?*

At the outset of the assessment process, Panel members and Council staff met with representatives from Health Canada to clarify the scope of the charge. To maintain the independence of the Panel and the integrity of its work, and in keeping with standard Council processes, this was the only time during the course of the assessment that the Sponsor was contacted. At this meeting, the Sponsor clarified that the Panel's report is not intended to be a program review. Rather, its findings were expected to help drive future research agendas, programs, and policies for the North. The Sponsor also noted that, although water is commonly included in definitions of food security, the Government of Canada is already engaged in a series of independent initiatives on water.

As a result, the emphasis of this assessment is on food, although the Panel agreed that water-related issues, ranging from access to potable water to the environmental protection of waterways, are critical considerations related to food security. The Panel did not include water in its report, but hopes that ongoing research and policy initiatives will continue to address this important topic.

For the purposes of the assessment, the Sponsor defined northern Canada as the "land and ocean based territory that lies north of the southern limit of discontinuous permafrost from northern British Columbia to northern Labrador," but also directed the Panel to consider communities served by the Nutrition North Canada program. Because these two definitions do not directly align with one another (e.g., at least five communities covered by the Nutrition North program would not be included if the permafrost line was used as the boundary), the Panel decided to include the entire region covered by the Nutrition North

Created by: Glenda Smith, Oct 2013
Hydrology and Boundaries: GeoGratis (Atlas of Canada Vector Data)
Southernmost limit of discontinuous permafrost boundary line: Aboriginal Affairs and Northern Development Canada – Northern Scientific Training Program (NSTP)
Nutrition North Data: Indian and Northern Affairs Canada, News Releases, 2011.
Datum – D_North_American_1983; Projection – Canada_Albers_Equal_Area_Conic

Figure 1.1

Geographic Scope of the Assessment

This map illustrates the geographic area of "North" as understood by the Panel. All area north of the southernmost limit of discontinuous permafrost is included in this assessment (area shaded in green). The approximate area served by the Nutrition North Canada program (area shaded in blue) as of 2011–2012, which coincides with the beginning of this assessment, is also included. This vast area is noted for its diversities — cultural, biological, linguistic, and geographical, to name a few. Rates of food security, and the means by which food security is achieved, also vary regionally. For example, the availability and type of wild food in northern Saskatchewan differs from that on Baffin Island; traditional knowledge varies in turn.

program (rather than only the communities), as well as the region north of the southernmost limit of discontinuous permafrost (see Figure 1.1). The Panel determined that, by combining these two zones, northern regions of the provinces could be integrated into its analysis, along with observations and practices from regions not covered by Nutrition North Canada (such as the majority of Yukon). Importantly, this definition incorporates biophysical, geographic, and political definitions of the North and amalgamates them into a coherent and inclusive whole. This whole is intended to convey that the geographic location of communities in northern Canada influences the accessibility, availability, adequacy, and acceptability of both traditional/country and market food. Such communities are often remote, not only in terms of physical distance to sources of market food, but also in terms of poor transportation infrastructure to help bring that food to the communities (Thompson *et al.*, 2012). The cost of transportation is often passed on to consumers.

1.2 INTENT OF THE REPORT

Consistent with Council methodology, the assessment presents evidence and findings, but no policy recommendations. Its findings can guide future food security programs, particularly in the areas of nutrition and environmental health. More broadly, the findings can help develop priorities for the North. They create an opportunity for the Health Portfolio[5] and the Government of Canada to identify knowledge gaps and opportunities to direct northern food security research to priority areas, with a vision of increasing food security in the North in a culturally appropriate manner, as well as collaboratively reflecting the needs of northern Aboriginal peoples. The assessment is also relevant to non-governmental organizations (NGOs), the academic community, governments at multiple levels of jurisdiction, retailers, international organizations — including international Indigenous organizations — and, of course, the people and communities of the North who are affected by, and respond to, food security and health issues every day. It intends to provide clear and reliable evidence on the state of knowledge on food security in northern Canada and the extent to which northern Aboriginal peoples have access to adequate amounts of safe and healthy food. The Panel hopes that the report will lead to evidence-based policies; increased cooperation and coordination of research agendas among stakeholders; and, ultimately, improvements in the health outcomes, socio-economic status, and social determinants of health and well-being of northern Aboriginal peoples.

5 Including the Canadian Institutes of Health Research and the Public Health Agency of Canada.

1.3 FOOD SECURITY, THE RIGHT TO FOOD, AND THE EMERGENCE OF FOOD SOVEREIGNTY

Food security, a concept that has evolved since its first appearance in international development and economics literature in the 1970s, has several definitions (FAO, 2003). While early definitions focused on food supply, the concept expanded in the 1980s to include food access and demand, and in the 1990s to include the pillars of *access, availability, use,* and *stability* (FAO, 2006). Some promote the components of *accessibility, availability, acceptability,* and *adequacy* (Myers *et al.*, 2004), while others argue for the inclusion of *agency* as a central element (RCSFS, 2012). Common understandings of these terms are reflected in the Glossary.

As defined at the World Food Summit in 1996, the Rome Declaration on World Food Security states that **food security** exists "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996). **Nutrition security**, a related concept, extends beyond dietary adequacy to encompass aspects of adequate caring practices, health, and hygiene (FAO *et al.*, 2012). According to the Academy of Nutrition and Dietetics, nutrition security requires that "all people have access to a variety of nutritious food and potable drinking water; knowledge, resources, and skills for healthy living; prevention, treatment, and care for diseases affecting nutrition status; and safety-net systems during crisis situations" (Nordin *et al.*, 2013).

Recent developments have sought to emphasize the nutritional purpose of food security, including principles in the right to food guidelines developed by member states and endorsed by the Food and Agriculture Organization of the United Nations (FAO) Council in 2004 (FAO, 2005) and at the 2009 World Summit on Food Security (FAO, 2009). The Guidelines ultimately resulted in a 2012 proposal via the Committee on World Food Security, or CFS (the re-formed FAO Committee on World Food Security), to change the terminology to **food and nutrition security**. The new definition of this extended concept proposed by the CFS is that food and nutrition security exists

> when all people at all times have physical, social and economic access to food, which is safe and consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life (CFS, 2012).

The term *food and nutrition security* is intended to complement the issues concerning food production and harvesting, food systems, and socio-economic aspects with the biological approach inherent in the *nutrition security* concept (CFS, 2012).

Food insecurity is an equally important term. It is an outcome of inadequate or uncertain access to an acceptable amount and quality of healthy food (Tarasuk, 2009). The availability of local food has historically been affected by a number of external factors, variously linked to food security or food insecurity. Globally, dimensions of food access, availability, use, and stability have changed vastly over time. Northern Canada's recent history has been marked by major shifts in social, cultural, economic, political, and environmental conditions, with significant implications for the health and well-being of Aboriginal peoples.

In general terms, *food insecurity* refers to both the inability to secure an adequate diet today and the risk of being unable to do so in the future. The Panel addressed both aspects: current food insecurity wherever it may exist among the Aboriginal peoples in northern Canada, and the prospects for future food insecurity given various scenarios of climate change, changes in economy, culture, or social life, and changes in patterns of social assistance and protection.[6]

Food security is also approached as a **human rights** issue. This approach is endorsed by scholars (Damman, 2005; Eide, 2005; Rideout *et al.*, 2007; Damman *et al.*, 2008), Canadian Aboriginal organizations (ITK & ICC, 2012; ITNAHO, 2012), international bodies such as the FAO Committee on World Food Security, and the UN Right to Food campaign. The human right to adequate food is contained in international conventions to which the vast majority of states, including Canada, are parties. The UN understands the content of this right as the universal right of all persons and all peoples to food, which provides the basis for a human rights approach to food security. Rather than the right to a minimum ration of calories (dietary energy), the right to adequate food is an inclusive right to "all nutritional elements that a person needs to live a healthy and active life, and the means to access them" (OUNHCR & FAO, 2010). Canada has ratified the UN's *International Covenant on Economic, Social and Cultural Rights* and is therefore bound to implement, in good faith, the rights included in that Covenant, including the right to food as set out in

6 The scientific measurements of food security are actually of its converse, food insecurity, as reflected in interview or survey data on how often food supplies were inadequate in a household. Data are routinely reported as percentages of interviewees who are food insecure. The Panel chose to use both terms in the report, depending on what specifically was being discussed, and occasionally to combine them into *food (in)security* when the text refers to both food security and food insecurity at once.

Article 11.1 (UN, 1966). All human rights, including the right to food and the right to health, imply obligations on state parties to the relevant conventions. The relevant monitoring body of the UN, the Committee on Economic, Social and Cultural Rights, has pointed out that the right to adequate food, like any other human right, imposes three types or levels of obligation on state parties: the obligations to respect, to protect, and to fulfil. In turn, the obligation to fulfil incorporates both an obligation to facilitate and an obligation to provide (ECOSOC, 1999).

The 1948 *Universal Declaration of Human Rights* (UN, 1948) and the 1966 *International Covenant on Economic, Social and Cultural Rights* (UN, 1966) enshrine the right to food in human rights law at the international level.[7] Indigenous representatives, on the occasion of the 2002 Global Consultation, signed the *Declaration of Atitlan* and stated that they were "in agreement that the content of the right to food of Indigenous peoples is a collective right" (FAO, 2007). The Government of Canada announced its support for the *United Nations Declaration on the Rights of Indigenous Peoples*, or UNDRIP (UN, 2008), in 2010 (AANDC, 2010e). The UNDRIP codifies a range of Indigenous peoples' rights, including their collective right to "maintain and develop their political, economic, and social systems or institutions, to be secure in the enjoyment of their own means of subsistence and development, and to engage freely in all their traditional and other economic activities" (Article 20); the right to improvement of their economic and social conditions (Article 21); the right to the enjoyment of "the highest attainable standard of physical and mental health" (Article 24); and the right to own, use, develop, and control the lands, territories, and resources they have traditionally owned or occupied (Article 26) (UN, 2008).

The human rights approach to food security supports the rights surrounding **food sovereignty**, a concept that evolved through various international conferences, fora, and organizations (e.g., the Second International Conference of La Vía Campesina, 1996; the International Planning Committee for Food Sovereignty, 1996; the World Forum on Food Sovereignty, 2001; and the Nyéléni International Forum on Food Sovereignty, 2007). Although a larger body of information addresses food security, considerably less information exists on food sovereignty. Wiebe and Wipf (2011) note that definitions of food security largely ignore "power relations that determine production, distribution and consumption patterns within the food system." The concept of food sovereignty explicitly acknowledges

7 For example, Article 25 of the *Universal Declaration* states, "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food" (UN, 1948). Set within a human rights framework, "violating the right to food may impair the enjoyment of other human rights, such as the right to health, education, or life, and vice versa" (OUNHRC & FAO, 2010).

this context and is broadly defined as "the right of nations and peoples to control their own food systems, including their own markets, production modes, food cultures and environments" (Wiebe & Wipf, 2011). Furthermore, unlike the concept of food security and the human rights approach to food, food sovereignty offers a frame through which to understand power relations and decision-making that shape food access (Fairburn, 2007). Food sovereignty is distinguished as a food paradigm that challenges the political and economic structures and interests within which the food system is determined. Based on the principles of providing food for people, valuing food providers, localizing food systems, enabling local control of land and food resources, maximizing local knowledge and skills, and promoting environmental sustainability (Nyéléni, 2007a), food sovereignty is understood to foster the economic, political, and cultural sovereignty of peoples, and is primarily concerned with sustainably satisfying local and national needs (WFFS, 2001).

At the core of food sovereignty is the principle that decisions about food systems should be made by those who depend on them (Patel, 2012):

> Food sovereignty is more than a right; in order to be able to apply policies that allow autonomy in food production it is necessary to have political conditions that exercise autonomy in all the territorial spaces: countries, regions, cities and rural communities. Food sovereignty is only possible if it takes place at the same time as political sovereignty of peoples (Nyéléni, 2007b).

1.3.1 Canada's Domestic and International Commitments to Food Security

Drawing on several of the provisions in the UNDRIP (UN, 2008), consideration of food sovereignty draws attention to how rights, responsibilities, and decision-making roles and powers linking directly to food security play out in northern Canada. While international bodies provide important venues for identifying food security goals, the obligation to realize the right to food rests with national governments (Rocha, 2007). Nationally, addressing food security involves coordination and cooperation between various actors at different levels and sectors of government, communities, regions, provinces, and territories. As noted previously, the UN Committee on Economic, Social and Cultural Rights has pointed out that the obligations of state parties to the *International Covenant on Economic, Social and Cultural Rights* fall into several categories. First, the obligation to *respect* existing access to adequate food requires states parties not take any measures that may result in preventing such access as already exists. Second, the obligation to *protect* requires the state to take measures to ensure that enterprises or individuals do not deprive people of their access to adequate

food. Finally, whenever an individual or group is unable to enjoy the right to adequate food by their own means, states have the obligation to *fulfil (provide)* that right directly (ECOSOC, 1999). This obligation means that states must proactively engage in activities intended to strengthen people's access to, and use of, resources, along with the means to ensure their livelihoods, including food security.

Canada's Action Plan for Food Security (Government of Canada, 1998) was intended to respond to World Food Summit commitments as well as build on Canadian economic, social, and environmental programs and policies to promote international and domestic food security. Ten priority areas were identified, including defining and respecting the right to food, reducing poverty, engaging in fair trade, and promoting traditional food acquisition by Aboriginal peoples. The latter was to be addressed through actions such as adhering to existing agreements and commitments, coordinating information and identifying gaps, and mainstreaming food security concerns into future policies and programs. As Power (2007) argues, however, there is little evidence that the infrastructure exists to implement these actions or that the international commitments (outlined in Table 1.1) influence Canadian policy in meaningful ways.

Table 1.1

Domestic and International Policy Guidelines Pertaining to the "Right to Food"

Type of Agreement	Name of Agreement	Year	Description
International	Universal Declaration of Human Rights	1948	• Declaration adopted by United Nations General Assembly, including Canada • Describes set of human rights to be protected internationally, including the Article 25(1) right to an adequate standard of living, including food
International	International Covenant on Economic, Social and Cultural Rights (ICESCR)	1966	• Internationally binding treaty ratified by and in force in Canada since 1976 • Explicitly recognized in Article 11 is the right to an adequate standard of living, including food, and the fundamental right to be free from hunger
Domestic	Canadian Charter of Rights and Freedoms	1982	• Included in Canadian Constitution • Sets out essential rights and freedoms for all Canadians, including rights to life and equality

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Type of Agreement	Name of Agreement	Year	Description
International	Convention on the Rights of the Child	1989	• International multilateral treaty ratified by and in force for Canada since 1991 • Articles 24 and 27 set out obligations for rights of children to health and to an adequate standard of living
International	World Declaration on Nutrition	1992	• Non-binding declaration endorsed by 159 countries in World Conference on Nutrition, Rome, 1992 • Recognizes food as part of a right to an adequate standard of living
International	Rome Declaration on World Food Security and World Food Summit Plan of Action	1996	• Non-binding declaration adopted by 186 countries at the World Food Summit • Seeks clarification of content of the right to food
International	Code of Conduct on the Human Right to Adequate Food	1997	• Series of guidelines and principles for nations to implement the right to adequate food, including state obligations at the national and international level
Domestic	Canada's Action Plan for Food Security	1998	• Federal policy framework in response to commitments of the World Food Summit Plan of Action, including plans for cross-sectoral participation in efforts to achieve the right to food • Led to formation of the Food Security Bureau within Agriculture and Agri-Food Canada
International	General Comment 12, The Right to Adequate Food (Article 11 of ICESCR), Committee on Economic, Social and Cultural Rights (CESCR)	1999	• CESCR's interpretation of the content and implementation of the right to adequate food as outlined in the ICESCR • Not officially binding but considered authoritative • Establishes precise content and means of implementation of the right to adequate food

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Type of Agreement	Name of Agreement	Year	Description
International	Food and Agriculture Organization of the United Nations' *Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security*	2004	• Adopted by the 127th session of the FAO Council; developed by an Intergovernmental Working Group established by the FAO Council • These voluntary guidelines offer tools that are meant to help the global community achieve the Millennium Development Goals; they represent the first attempt by governments to interpret an economic, social, and cultural right and suggest actions for its implementation (FAO, 2005)
International	*United Nations Declaration on the Rights of Indigenous Peoples*	2007	• Declaration adopted by United Nations General Assembly, endorsed by 144 states; Canada initially voted against it (UN, 2007), but has subsequently endorsed this non-legally binding aspirational document (AANDC, 2012f) • Lists a broad range of Indigenous peoples' rights as examples of provisions with which member states are expected to comply; Articles 3, 5, 11, 20, 21, 24, and 26 can be understood as having particular relevance to the right to food

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From the perspectives and research described above, achieving food and nutrition security encompasses more than ensuring that people are free from hunger. Motivated by the diversity of scholarship and legal instruments that conceptualize food security broadly, the Panel chose an approach that would address the multiple dimensions of food insecurity. The framework presented in Chapter 2 organizes the key concepts of food security, right to food, and food sovereignty in relation to other factors needed to understand food security for northern Aboriginal peoples in Canada.

1.4 STRUCTURE OF THE REPORT

The remainder of this report addresses the charge to the Panel by reflecting on food security as a determinant of northern Aboriginal peoples' health. The report is organized as follows:

Chapter 2 outlines the Council's processes, the assessment methodology, and the organizing framework developed by the Panel.

Chapter 3 examines the challenge of food security in northern Canada, focusing on rates of food insecurity among all Aboriginal populations and particularly vulnerable populations such as women and children (where data are available). It also looks at the connections between food insecurity and health, focusing on health indicators of particular concern for northern Aboriginal peoples.

Chapter 4 explores food security in the context of demographics, place, and aspects of Indigenous culture that include Indigenous knowledge practices. It presents demographic information on the diverse Aboriginal peoples who live in the Canadian North and introduces Indigenous holistic concepts of health and wellness. It also discusses the relationships between culture, health, and food security, including a review of traditional practices promoting food security.

Chapter 5 examines the traditional/country food system, an important contributor to the food security of northern Aboriginal peoples. Using harvest data and dietary recall studies, the chapter presents an overview of the prevalence of traditional/country food consumption in northern Canada and explores the importance of this critical food system across communities, regions, and populations.

Chapter 6 describes the market/imported food system in northern Canada and examines its logistical and pricing challenges.

Chapter 7 identifies the impacts of the transition from a traditional/country food system to a market/imported food system on the lives of northern Aboriginal peoples.

Chapter 8 focuses on environmental change, place, and intergenerational well-being. An examination of how these factors are linked to resources draws out the complex connections between food security and food sovereignty, subsistence species of northern plants and animals, and the realities of contaminants and climate change.

Chapter 9 explores factors such as rights and governance that have complex relationships with food security, food sovereignty, and northern Aboriginal peoples. It also considers how regulatory issues and devolving systems of northern governance affect the potential of northern Aboriginal peoples to achieve food security and food sovereignty.

Chapter 10 highlights promising national and international practices in food security and food sovereignty, as well as comparative approaches to developing research and knowledge systems in support of interventions to mitigate food insecurity.

Chapter 11 offers the Panel's final observations and provides a succinct response to the charge.

2

Methodology and Conceptual Framework

- Methodology
- The Panel's Approach to the Assessment: The Conceptual Framework
- Central Themes: Northern Aboriginal Peoples, Food Security, and Food Sovereignty
- Inner Wheel Factors
- Outer Wheel Factors
- Framing Factors

2 Methodology and Conceptual Framework

Key Findings

It is challenging to measure food security, given the diversity and complexity of Canadian Aboriginal peoples and of their food systems in the northern context. Studies on food (in)security vary in scale, scope, depth, and method. As a result, it is difficult to compare data sets to identify geographical and temporal trends and patterns in food security.

Both traditional and Western scientific knowledge represent valuable sources of evidence for food (in)security among Aboriginal peoples in northern Canada.

The literature on northern food security lacks a universally accepted analytical framework that can fully explain how social, cultural, and material conditions are linked, as well as the transformations driving changes in diet and ways of life in northern Aboriginal communities.

Tackling food insecurity in northern Canada head on requires conceptualizing it first and foremost as an issue that affects human well-being. The Panel's conceptual framework is explicitly people-centred and presents the complex interplay between northern Aboriginal peoples and their cultures, rights, resources, health, and the broader "framing" factors contextualizing these issues. This approach emphasizes the direct and serious impacts of food (in)security on people's lives and livelihoods.

Further research is required to clarify the processes by which some of the factors in the Panel's framework, such as gender, and knowledge and preferences, act as enablers of or barriers to food security for diverse groups of northern Aboriginal peoples.

This chapter introduces the Panel's methodology and approach to the assessment, along with the Council's standard assessment process. The chapter begins by describing the data sources from published peer-reviewed literature and explaining how the Panel incorporated diverse Western and traditional knowledge sources into the assessment. It goes on to introduce a conceptual framework to visualize and convey the complex inter-relationships that allow for a holistic understanding of food security for northern Aboriginal peoples. The Panel developed this framework to overcome the lack of an adequate framework in the literature. The central themes of the framework are then discussed, followed by the "inner wheel" factors, "outer wheel" factors, and "framing" factors that exist within the framework.

2.1 METHODOLOGY

To undertake the assessment, the Council appointed a multidisciplinary panel of national and international experts that included Aboriginal and non-Aboriginal scholars with northern expertise in nutrition and Aboriginal health, environmental and health sciences, wildlife biology, economics, and technology, along with anthropology, sociology, history, law, and human rights. Panellists had in common extensive experience working with Aboriginal communities; most had lived and worked in northern communities, and many continue to do so. The broad range of expert perspectives was necessary to create a balanced and well-rounded report. The Panel met five times over 15 months to draft content and discuss findings. A draft version was peer-reviewed by 11 experts appointed by the Council, and comments were responded to accordingly.

2.1.1 Sources of Evidence: Traditional and Western Knowledge

Council reports are primarily based on peer-reviewed, published academic literature. This report incorporates the literature of the natural, social, and health sciences, as well as published academic literature and credible grey literature that deals with traditional knowledge. The Panel considers traditional knowledge on a par with academic research. A model for respectfully bridging traditional and Western knowledge is the *Arctic Climate Impact Assessment*, a project guided by the Arctic Council and the International Arctic Science Committee (ACIA, 2005). The Panel took a similar approach in its assessment.

Panel members brought to the assessment an informed body of knowledge on northern food security and health issues, much of it based on collaborative research projects with northern Aboriginal peoples. The Panel determined that because food security for northern Aboriginal peoples is multidimensional, a variety of perspectives, experience, and knowledge is required to fully understand its scope. Since Council methodology precludes direct stakeholder consultation, the Panel felt that effectively responding to the charge would require incorporating all available evidence sources, including those stemming from traditional knowledge and grey literature. As a result, the Panel sought the cooperation of national Aboriginal organizations and others to seek out additional evidence. The Assembly of First Nations, the Inuit Circumpolar Council (Canada), the Inuit Tapiriit Kanatami, and the Métis National Council were contacted. In addition, evidence was obtained from key individuals from Inuit Tuttarvingat and the National Aboriginal Health Organization (NAHO, no longer in existence); the Government of Nunavut and Government of the Northwest Territories; Nutrition North Canada; Health Canada's Food Security Reference Group; Aboriginal Affairs and Northern Development Canada's Northern Contaminants Program; and Statistics Canada.

Guided by its conceptual framework (described in Section 2.2), as well as by the expertise of its members, the Panel reviewed the following types of evidence:

- books and journal articles;
- information about ongoing northern research projects (e.g., posters, abstracts, websites), particularly from collaborative and participatory projects incorporating the expertise of northern Aboriginal peoples;
- studies and documents commissioned or prepared by the four Aboriginal organizations contacted and noted above;
- grey literature in the form of reports, documents, and presentations from territorial governments and departments, federal departments and programs including AANDC's Northern Contaminants Program and Health Canada's Food Security Reference Group, and international organizations including the Arctic Council, the UN, and the FAO;
- northern Aboriginal population and health statistics from reports and databases (e.g., International Polar Year (IPY) adult and child Inuit Health Surveys, Nunavik Inuit Health Survey, First Nations Regional Health Survey, First Nations Food, Nutrition and Environment Study, Statistics Canada's Aboriginal Peoples Survey, Canadian Census, National Household Survey, and Canadian Community Health Survey);
- news articles that added context to current issues and trends that were not yet documented in the academic literature; and
- documents obtained through conference attendance, including the IPY 2011 Conference (Montréal, April 2012) and the Nunavut Food Security Symposium (Iqaluit, January 2013).

While the Panel had a rich evidence base from which to respond to the charge, it noted that useful and critical evidence also lies with traditional knowledge holders who have lived experience in northern Canada. A comprehensive review of northern food security derived from first-hand knowledge has yet to be undertaken in Canada.

2.1.2 Measuring Food Security

Appropriate measurement of food (in)security is essential for building food and economic aid strategies, reinforcing global monitoring systems, and assessing and informing program and policy responses (Jones *et al.,* 2013). Globally, multiple approaches to measuring food (in)security exist. However, as a 2013 compendium and review of measurement tools revealed, there are a number of measurement challenges such as measuring dietary adequacy, differentiating between components of food access, identifying cut-off points for defining food insecurity, acknowledging the strengths and weaknesses of various metrics, moderating response bias, and validating measures (Jones *et al.*, 2013).

In December 2012, the Arctic Human Health Expert Group of the Arctic Council organized a workshop on food security, with the goal of providing a basis for the selection of indicators relevant to food and water security in the circumpolar context. The background report (Nilsson & Evengård, 2012) noted that, as of 1999, approximately 200 definitions and 450 indicators of food security had been developed (Hoddinott, 1999). As an example, food access indicators identified included food security scores; monetary food costs; non-monetary food accessibility; the presence of a hunter, fisher, or collector in a family; and the physical ability (equipment, game close at hand, etc.) for hunting, fishing, collecting, or herding. The Nilsson and Evengård report represents a first step towards obtaining general agreement on the value of several indicators appropriate to understanding northern Canada — indicators that can be used to monitor change and drive collaboration between Arctic Council member states and permanent Indigenous participants (Nilsson & Evengård, 2012).

Much of the available information on the health conditions of northern Canadian Aboriginal populations is based on many smaller regional and community studies, in addition to a small number of large national surveys. The Panel noted that although these do contribute some information to the state of knowledge on food security and health in northern Canada, they cover different geographic areas and populations and do not always use comparable methods of data collection, thus making it difficult to draw conclusions across communities. Even when similar types of data are collected, differences in methodology, target populations, definitions used, and geographic coverage can render the data incomparable (Loppie Reading & Wien, 2009). This has implications for policy formation. The Panel also noted the significance of the limited gender-specific data relating to food security given the impact of food insecurity on women. Further, there is limited peer-reviewed and grey literature on Métis and food security.

In summary, food security measurement methods used to date have been valuable, but their ability to respond to the complexity of dimensions underlying food security in the Canadian Aboriginal and northern context is limited. This limits the extent to which (a) researchers can understand the inter-relationships between health and food systems across regions at the individual and community levels, and (b) northern Aboriginal peoples in Canada and the circumpolar world can identify common issues affecting their respective regions to work in partnership to mitigate food insecurity. While these challenges represent barriers to a full understanding of the scope of the problem, research to date clearly shows that food insecurity is a serious issue that needs to be addressed by all available means for the health of northern Aboriginal peoples. To aid in

the selection of appropriate food security metrics for future research projects, Jones *et al.* (2013) suggest that it is important to identify the specific components of food security that are to be measured; the data's intended application and purpose; the timeframe to be measured (e.g., chronic versus acute food insecurity); whether or not the survey is intended to have multiple iterations; the scale (e.g., household, national); and the resources that are available.

2.1.3 More on Traditional Knowledge: Definitions and History

Terms such as *Inuit Qaujimajatuqangit*, *traditional knowledge* or *traditional ecological knowledge*, *Aboriginal knowledge*, and *Indigenous ecological knowledge* or *Indigenous knowledge* are used to describe knowledge and ways of knowing developed by Indigenous peoples. Many of the definitions of traditional knowledge share the element of intergenerational knowledge transmission, as exemplified by Huntington's (1998) description of traditional knowledge as "a system of experiential knowledge gained by continual observation and transmitted among members of a community," and that of Brant (in Bombay, 1996), who characterized knowledge transmission as "a body of information about the connected elements of the natural environment which traditional Indigenous people have been taught, from generation to generation."

In Canada, the Traditional Knowledge Working Group of the Government of the Northwest Territories (GNWT) was one of the first government policy-makers to attempt to define traditional knowledge (see Legat, 1991). In 1997 the GNWT established a government-wide traditional knowledge policy (Traditional Knowledge Policy 53.03), whereby

> the Government recognizes that Aboriginal traditional knowledge is a valid and essential source of information about the natural environment and its resources, the use of natural resources, and the relationship of people to the land and to each other, and will incorporate traditional knowledge into government decisions and actions where appropriate (GNWT, 2005).

The Government of Nunavut similarly incorporated *Inuit Qaujimajatuqangit* — "that which Inuit have always known to be true" — into official government decision-making (Tagalik, 2010). Several international organizations acknowledge the value of traditional knowledge and actively incorporate it into their reports, including the United Nations Educational, Scientific and Cultural Organization (UNESCO) (Nakashima *et al.*, 2012); the World Intellectual Property Organization (WIPO, n.d.); the Convention on Biological Diversity (CBD, n.d.); the Inter-American Development Bank (IADB, 2006); the United Nations Conference on

Trade and Development (UNU-IAS, 2013); and UNESCO and the International Council for Science (ICS, 2002). Traditional knowledge also informs many of the publications of the Arctic Council. For the Canadian Chairmanship (2013–2015), the Minister responsible for the Arctic Council, Leona Aglukkaq, has prioritized the challenges facing the peoples of the Arctic and recognized the importance of traditional knowledge to their ways of life (Aglukkaq at Arctic Frontiers conference in Tromsø, Norway, 2013).

2.2 THE PANEL'S APPROACH TO THE ASSESSMENT: THE CONCEPTUAL FRAMEWORK

To approach a topic as multifaceted as food security, a conceptual framework is needed to explore and visualize the inter-relationships between direct and indirect factors influencing this issue. A number of different frameworks have been developed to address food security at individual (see Tarasuk, 2001), household (IFAD, n.d.), community (Glanz *et al.,* 2005), and global (GECAFS, 2009) levels. Some offer ways of analyzing people's vulnerabilities to food insecurity (Løvendal & Knowles, 2005), models for understanding the causes of low food consumption and poor nutritional status (FAO, 2000), or food choice process models (Sobal & Bisgoni, 2009). Others consider the location of neighbourhood stores and in-store food availability (Rose *et al.,* 2010), food systems and health disparities (Neff *et al.,* 2009), and components of rural food systems (Stubblefield *et al.,* 2010). Many existing models for understanding food security tend to be agriculturalist, with limited conceptualizations of food security that would attend to the active nature of northern Aboriginal food systems and practices.

A few models explore food security for Aboriginal people and communities in Canada (see FSRG, 2009; Thompson *et al.*, 2011), including components such as livelihood (Alternatives North, 2010; Thompson *et al.*, 2012); the human right to food (Damman *et al.*, 2008); space and time (Duhaime & Godmaire, 2002); factors from social systems and biophysical systems (Duhaime & Godmaire, 2002); the role of community food systems (Dietitians of Canada, 2007); the interlinked concepts of vulnerability, climate change, and the adaptive capacity of the Inuit (Ford, 2009); and the relevance of mixed economies (Duhaime & Godmaire, 2002; Dietitians of Canada, 2007; Alternatives North, 2010). Since none of these were adequate for exploring the Sponsor's broad charge, the Panel decided to develop a new framework.

The Panel determined the need for a holistic approach connecting the various factors contributing to food security, and indicated that this issue is ultimately about the health and well-being of people. Therefore, the Panel created a

people-centred framework that dynamically presents the complex interplay between northern Aboriginal peoples and their culture, rights, resources, and health, along with the larger framing factors that contextualize these issues (see Figure 2.1). Importantly, food security and food sovereignty are not viewed as discrete entities within the framework. Rather, they emerge from the inter-relationships between the multiple dimensions affecting northern

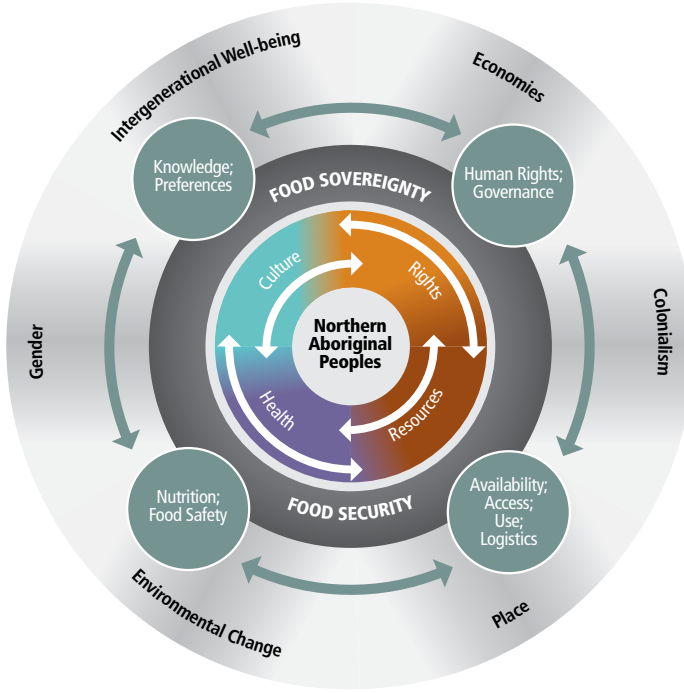


Figure 2.1

The Panel's Conceptual Framework

The Panel developed this dynamic, holistic, people-centred framework as a tool for analyzing and understanding food security and food sovereignty in northern Canada. The wheel represents the complex interplay between factors that affect northern Aboriginal peoples, and how food security and food sovereignty emerge from these relationships. Because the framework is fluid, no single factor should be interpreted as static or merely linked to the factor to which it is most closely positioned. Each factor is understood to have multiple relationships with other concepts within the wheel. The framework conveys the complexity of the factors that the Panel deemed necessary to respond to the charge, while also providing insight into (a) the relationships that emerge from these connections, and (b) the diverse factors that are important considerations in strategies to mitigate food insecurity.

Aboriginal peoples, underscoring the importance and need for a holistic and human-centred approach to this issue. The Panel agreed upon its conceptual framework early in the assessment process and continued to refine it to ensure it could capture the diversity of evidence and expertise explored and discussed throughout its deliberations. In the end, the Panel deemed the conceptual framework robust and valuable for visualizing connections among factors, and as an effective tool to help organize the findings of the report.

2.3 CENTRAL THEMES: NORTHERN ABORIGINAL PEOPLES, FOOD SECURITY, AND FOOD SOVEREIGNTY

Northern Aboriginal peoples are at the centre of the wheel in Figure 2.1 because food (in)security has direct and serious impacts on people's lives and livelihoods. Tackling this issue head on requires conceptualizing it first and foremost as one that affects human well-being. Aboriginal peoples in Canada are diverse, with a variety of distinct cultures, languages, and regions. Important differences also exist within and between First Nations, Métis, and Inuit populations. These differences can be driven by personal experience and social status, which are related in part to age, gender, and place. Recognizing segments of the population that are disproportionately affected by resource access and allocation is important to creating a more complete understanding of food security in northern Canada. The UN notes that people living in poverty in rural and urban areas, Indigenous people, children, and women experience particular challenges in realizing their right to food (OUNHCR & FAO, 2010).

The Panel's definitions of **food security** and **food sovereignty**, as well as their relationship to one other, were presented in Chapter 1. The framework builds on this understanding by highlighting their relationships with other factors. Both food security and food sovereignty can be understood as outcomes of the relationships between factors in the inner and outer wheels of the framework. Food security is more closely aligned with health and resources, whereas food sovereignty is more explicitly linked with issues focused on culture and rights (see Wittman *et al.,* 2010). The framework positions these terms accordingly while taking into account that all factors are inter-related. Food security can be considered a goal in itself, and food sovereignty a means by which to achieve it. Further, food sovereignty can still be a goal that, once achieved, can lead to food security. And, because all factors in the framework have implications for the well-being of northern Aboriginal peoples, no single factor can be considered *the* cause of food insecurity — or the remedy. In this way, food security and

food sovereignty are conceptualized as a means by which to achieve sustainable livelihoods[8] and improve and maintain community health and the well-being of people in northern Canada.

Some of the factors identified by the Panel, and discussed in the next three sections, may be seen as either enablers of or barriers to food security for diverse groups of northern Aboriginal peoples. Further research is required to clarify these factors, their roles, and the processes involved.

2.4 INNER WHEEL FACTORS

The four factors organized around northern Aboriginal peoples at the centre of the wheel are **health, culture, rights,** and **resources.**

A primary concept as laid out in the charge, **health** is one of the factors positioned towards the centre of the framework. Health is an enabler of food security (good health enables access to nutritious traditional/country or market food); a barrier to food security (poor physical, social, or mental health can inhibit access and use); and an outcome of being food secure. Aboriginal health encompasses not just the physical well-being of an individual, but the social, emotional, and cultural well-being of the whole community (NAHO, 2012), and extends to the environment (land and wildlife) that sustains it.

Culture can include the norms, traditional beliefs, and material traits of a social, ethnic, or religious group.[9] In the words of Deputy Grand Chief Vernon Roote, "culture to us means a whole way of life — our beliefs, language, and how we live with one another and creation" (Roote in RCAP, 1996). Relationships with the land, spirituality, and behavioural ethics in families, clans, communities, nations, and confederacies can all be considered components of culture (RCAP, 1996). Northern Aboriginal peoples have rich and diverse cultures that have been, and continue to be, connected to land-based livelihoods, but that are also undergoing rapid changes in language, social structures, economy, climate,

8 Chambers and Conway (1991) define a sustainable livelihood as follows: "A livelihood comprises people, their capabilities and their means of living, including food, income and assets. Tangible assets are resources and stores, and intangible assets are claims and access. A livelihood is environmentally sustainable when it maintains or enhances the local and global assets on which livelihoods depend, and has net beneficial effects on other livelihoods. A livelihood is socially sustainable which can cope with and recover from stress and shocks, and provide for future generations."

9 Culture is a complex concept with several nuances. For further reading, please see Handler's entry on pp. 198–202 in *The Social Science Encyclopedia, 3rd Ed.* (2004), A.Kuper and J. Kuper, eds., London & New York: Routledge.

land, and governance (Healey & Meadows, 2008). Culture is ingrained in each of the other factors in the framework. However, due to its widespread influence, it is located on the inner wheel, a position that conveys its importance.

An understanding of Aboriginal **rights** in the Canadian context is important in an analysis of food security and health. Access to health care and food, land and harvesting rights, the provisions of modern treaties and land claims agreements, and aspirations and actions to facilitate self-determination are all issues salient to northern Aboriginal peoples in Canada and, indeed, common to Indigenous peoples worldwide. Kulchyski (2013) remarks that it is important to make the distinction between Aboriginal rights and human rights because Canadian Aboriginal people have unique legal rights (due to their indigeneity) requiring state fiduciary obligations. The Panel recognized the importance of both Aboriginal rights and human rights, along with their linkages to food sovereignty and self-determination regarding food systems, and how these all contribute to achieving food security.

In the context of this assessment, **resources** can be conceptualized as both natural resources (renewable and non-renewable resources) and capital resources (physical, mental, financial, human, and social resources). When resources of both types are abundant, they can facilitate good health and food security, but a shortage of either can have negative effects. This framework appreciates the important role that natural resources play in the lives of people who have survived on the land for generations, but also considers financial resources such as money to buy food (market) or gas and bullets to hunt (traditional/country food), as well as human and social resources such as the knowledge, skills, and education to choose and prepare food. Because the food supply in northern Canada is a mix of traditional/country and market food, access (or the lack thereof) to both natural and capital/social resources can in turn influence (negatively or positively) people's access to traditional/country food and market food; these are central concepts in this assessment.

2.5 OUTER WHEEL FACTORS

The factors on the framework's outer wheel — **nutrition and food safety; knowledge and preferences; human rights and governance;** and **availability, access, use, and logistics** — have linkages with each other as well as with the factors on the inner wheel. The dynamic nature of the framework appreciates the inter-relationships among factors that ultimately determine the food security and food sovereignty of northern Aboriginal peoples.

Nutrition is an integral part of food security, as one cannot move from food security to complete health without considering food quality and nutrition. Nutrition focuses on the nutrients in food, but also on the body's ability to metabolize food and use those nutrients effectively to lead a healthy and active life (CFS, 2012). Any amount of food that lacks nutritional quality, including concerns for excess dietary energy and obesity, may be an inhibitor of food security and lead to negative health outcomes. Access alone, without an understanding of the nutritional deficits in contemporary northern diets, will not necessarily lead to nutritionally adequate diets and subsequently improved health outcomes. Given the dynamic nature of the framework, nutrition is connected to all the other factors, and this holism is a hallmark of the Aboriginal perspective on health. As Ingmar Egede remarked in *Silent Snow*, "Our foods do more than nourish our bodies. They feed our souls. When I eat Inuit foods, I know who I am" (Cone, 2005).

Food safety addresses the complex risks northern Aboriginal peoples face when they (a) consume traditional/country food affected by contaminants or pathogens; (b) engage in potentially unsafe food preparation, storage, and cooking practices; and (c) consume unsafe (e.g., expired, unhealthy) market food. Because traditional/country food is strongly associated with good health in many Aboriginal communities (Willows, 2005) and considered more nutritious than most accessible market food (Kuhnlein & Receveur, 2007; Richmond, 2009), its importance to both health and community relationships is significant.

Knowledge and preferences highlight the importance of traditional knowledge and cultural practices for food security and food sovereignty. Northern Aboriginal peoples have important knowledge about traditional/country food, including its health properties and cultural significance, as well as formal and informal education regarding food choice, preparation, and use. The idea of preferences further illustrates how food security is not solely an issue of "enough" food, but attends to a more complex understanding of preference beyond what is available or simply what tastes good, including eating habits, social context, cultural importance, traditional knowledge, and practices that help demonstrate the connections between the land, food, and health (Bernier *et al.*, 2003; Pufall *et al.*, 2011). Traditional knowledge plays a key role in forming preferences, but preferences and practices change over time, especially with the introduction and greater consumption of market food, social change in communities, and even globalization. Within the framework, knowledge and preferences, developed by northern Aboriginal peoples by way of culture, are important for understanding food security and food sovereignty — or the lack thereof — in both traditional and market-based food systems.

Food sovereignty helps position food security in a framework of rights variously defined as Aboriginal rights, human rights, health rights, and the right to adequate, safe food and nutrition. **Human rights** approaches and **governance** structures are important considerations because they influence the degree to which food sovereignty and food security can be achieved in the North. The right to food is closely associated with other fundamental human rights codified by international human rights law, including the number one goal of the eight UN Millennium Development Goals: to "eradicate extreme hunger and poverty" (UNDG, n.d.). The extent to which some of these rights can be realized is affected by structures of governance and their associated regulatory regimes at the international, federal, provincial, and territorial levels. Governance and the acknowledgement of Aboriginal and human rights, as they apply to both traditional and market-based food systems, have implications for the food security and food sovereignty of Northerners.

Availability, accessibility, and **use** (in addition to adequacy, acceptability, agency, and stability) are part of food security (Myers *et al.*, 2004; FAO, 2006; RCSFS, 2012) and address the complexity of and differences between traditional and market-based food systems, along with the availability of various foods, people's access to them, and their ability to put them into use. Further, in the North, the **logistics** and costs of transporting, storing, and selling market-based food in mostly small and remote communities are very different from those in southern and largely urban regions. Given the remote nature of the Canadian North, hunting and market-based logistics must be carefully considered because they have significant impacts on how people obtain and choose their food, how they prepare or use it, and the implication of these for both food sovereignty and food security.

2.6 FRAMING FACTORS

The six contextual factors (themes of discussion), **intergenerational well-being, economies, environmental change, place, gender,** and **colonialism,** provide a broader context wherein each enables or acts as a barrier to food security, food sovereignty, and the livelihood and well-being of northern Aboriginal peoples. Each contextual factor (hereafter noted as *factor*) is linked in multidirectional relationships with northern Aboriginal peoples and the issues affecting their food security and food sovereignty. For example, community assets can be activated to build culture and health, with positive implications for intergenerational well-being; and, similarly, the degree to which intergenerational well-being is achieved has implications for individual and community health and culture.

Blackstock (2008) notes:

> Aboriginal peoples view themselves as a link in a long chain of people who have come before and those who will follow. In this context, you are special to the extent that you live in a good way and pass along the information and values necessary to sustain your group across time.

Intergenerational well-being is both a requirement for food security (e.g., the health and well-being of community members and individuals enable them to pass along traditional knowledge, skills, and values) and an outcome of food security (e.g., health and well-being are promoted by and through access to nutritious traditional/country and market food). Intergenerational well-being is important to the overall picture of Aboriginal community health and wellness, as well as to the connection community members have to their land and culture. Without a factor that attends to the continuity across generations and the historical traumas and losses Aboriginal people have experienced, the contemporary realities of food insecurity and resultant poor health outcomes could not be fully articulated, nor could ideas for empowering strategies that enable people to maximize their human potential.

Economies as a framing factor speaks to how people's modes of living, including obtaining food, differ in the North from other parts of Canada. This factor highlights the North's mixed economic model, which combines traditional (subsistence) and market (wage) economies, both of which are tied to greater economic currents and to rapidly changing realities in communities and households. Market food is costly to import and distribute in the North. Methods for obtaining traditional food (such as caribou, seal, and whale) are both capital- and labour-intensive (requiring gas, boats, all-terrain vehicles, snow machines, rifles, ammunition, and time on the land). Wage economies are one piece of this issue, but do not encapsulate the larger concepts of consumerism and capitalism that contribute to issues surrounding environmental change, intergenerational well-being, and even understanding of place. Poverty and the complex socio-economic realities that individuals and communities face constitute but a few issues that provoke adaptive and resilient behaviours resulting in complex combinations of wage-earning and traditional activities to provide food.

The literature calls for more interdisciplinary and integrated research addressing the interactions between food security and global **environmental change** (Ingram *et al.*, 2010). Environmental change is occurring rapidly in the Arctic, with implications across the framework and strong links to both food security and food sovereignty. In the North, more so than in other regions of the world,

environmental change has significant impacts on food systems, given that Aboriginal livelihoods are closely linked with climate, weather, and ecosystems that support and affect hunting, fishing, trapping, and other food procurement activities. Climate change and the resulting sea-ice loss and permafrost melt (ACIA, 2004) are changing access to wildlife and other traditional food, and may play a significant role in the uptake of market-based food of "lesser quality and cultural relevance" in northern communities (Ericksen *et al.*, 2010). Although northern Aboriginal peoples have always lived with and responded to climate variability and change, such resilience has been facilitated by highly adaptable cultural practices. Younger generations may be more at risk due to their lack of experience in hunting and to changing social circumstances that offer them less access to experienced hunters (Ford *et al.*, 2006). "Putting the human face on climate change" (Nickels *et al.*, 2005) requires analysis at all levels to understand how communities are both vulnerable and adapting to rapid environmental change.

As a **place**, the Canadian North has unique geographic, cultural, political, and historical features that require attention at the broadest level of analysis. While northern communities vary physically, socially, culturally, and economically, most are situated in remote areas and this creates enablers of and barriers to food security and food sovereignty that must be considered. Further, Aboriginal peoples have important connections with their lands, and this linkage between place and health contributes to cultural, spiritual, emotional, physical, and social well-being that is important in understanding northern communities (Wilson, 2003).

Gender consistently intersects with the other variables in the framework. Although women play an important role in achieving food security at several levels, they tend to be disproportionately affected by food insecurity, hunger, and poverty on a global scale (OUNHCR & FAO, 2010). In northern Canada, too, results from the limited studies on this topic suggest that women tend to have specific food security concerns related to feeding their children (Healey & Meadows, 2008), and Canadian Inuit women are more likely than men to be food insecure (Ford & Berrang-Ford, 2009). The Panel noted the paucity of data both at the household level and particularly at the gender level.

As a final point, the Panel recognized the significant impact of **colonialism**, and environmental dispossession, on food security for northern Aboriginal peoples, and considered it a fundamental factor. Aboriginal peoples' struggle with the impacts of colonialism consists in large part of efforts to redress the consequences of being forcibly removed from the land or being denied access to the land to continue traditional cultural activities, as well as the psychological,

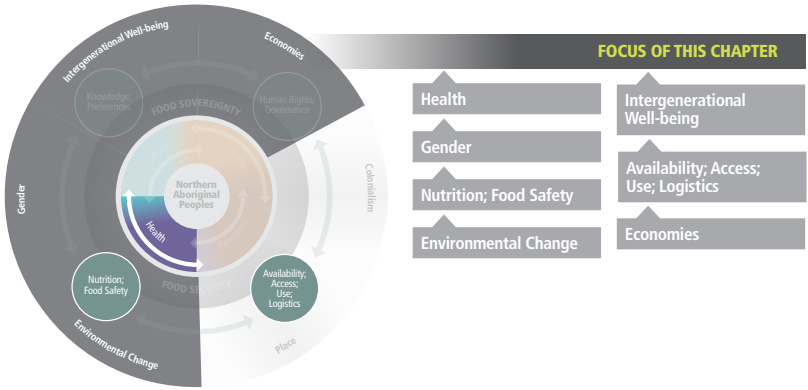
physical, and financial effects of dispossession (Alfred, 2009). One of the most powerful methods of assimilation was the residential school system, which is "often considered the vanguard of genocide and re-socialization of Aboriginal peoples" (Loppie Reading & Wien, 2009). The effects of colonialism and residential schooling have been widespread and, in many cases, traumatic. Without parents and Elders to pass on their knowledge, generations of children were unable to acquire skills and knowledge in traditional approaches to the land, harvesting, survival, and social support, with clear implications for food security and food sovereignty.

3

Food Insecurity: The Scope of the Problem

- Rates of Food Insecurity
- Food Security and Links to Health
- Conclusions

3 Food Insecurity: The Scope of the Problem



Key Findings

Aboriginal households across Canada experience food insecurity at a rate about two times higher than that of non-Aboriginal households. Households with children consistently report even higher rates of food insecurity, and more women than men are affected.

The seriousness of this situation and its impact on individuals, families, communities, the health care system, and the economy cannot be overstated. Results from the 2007–2008 IPY Inuit Health Survey show that the people of Nunavut had the highest food insecurity rate for any Indigenous population in a developed country.

Food security is an important and complex multi-sectoral issue with serious implications for Aboriginal health. Food insecurity is linked to negative physical and mental health outcomes, including poor dietary quality, under-nutrition, obesity, chronic diseases, poor educational outcomes, and family stress.

Comprehensive surveillance data on the health status of Aboriginal peoples across the Canadian North are lacking.

In 2008, the Canadian Community Health Survey (CCHS) reported that 11.3% of Canadian households, or about 3.4 million Canadians, experienced some level of food insecurity. By 2011, this percentage had increased to 12.3%, representing an additional 450,000 Canadians living with food insecurity (Tarasuk *et al.,* 2013). In total, 1.6 million Canadian households experienced some level of food insecurity in 2011, which represents nearly one in eight households. This translates to approximately 3.9 million affected individuals, including 1.1 million children. Available data indicate a higher prevalence of food insecurity among Aboriginal populations than in the general Canadian population. In 2011, 27% of households where the respondent identified as Aboriginal were food insecure, compared to 11.5% of non-Aboriginal households (Tarasuk *et al.*, 2013).

CCHS results suggest that rates of household food insecurity are related to several socio-demographic characteristics, including region, source of income, level of education, gender, Aboriginal status, immigrant status, home ownership, and urban versus rural residence. Food insecurity has many documented effects on the individuals and communities experiencing it, including important public health issues (Egeland, 2011). This chapter examines in detail the problem of food insecurity in the Canadian North, focusing on rates of food insecurity among all Aboriginal populations as well as for particularly vulnerable populations. It then discusses the connection between food insecurity and health, focusing on health indicators of particular concern for northern Aboriginal peoples.

3.1 RATES OF FOOD INSECURITY

Data on food insecurity are collected through the CCHS. This cross-sectional survey administered by Statistics Canada collects health information from about 60,000 Canadians annually. The survey, however, does not include full-time members of the Canadian Forces, people living in prisons and care facilities, homeless populations, and, importantly for the context of this assessment, people living on First Nations reserves or Crown Lands and those in the Quebec health regions of Région du Nunavik and Région des Terres-Cries-de-la-Baie-James. As a result, Tarasuk *et al.* (2013) note that the true prevalence of food insecurity is underestimated in the survey, especially because homeless people and on-reserve

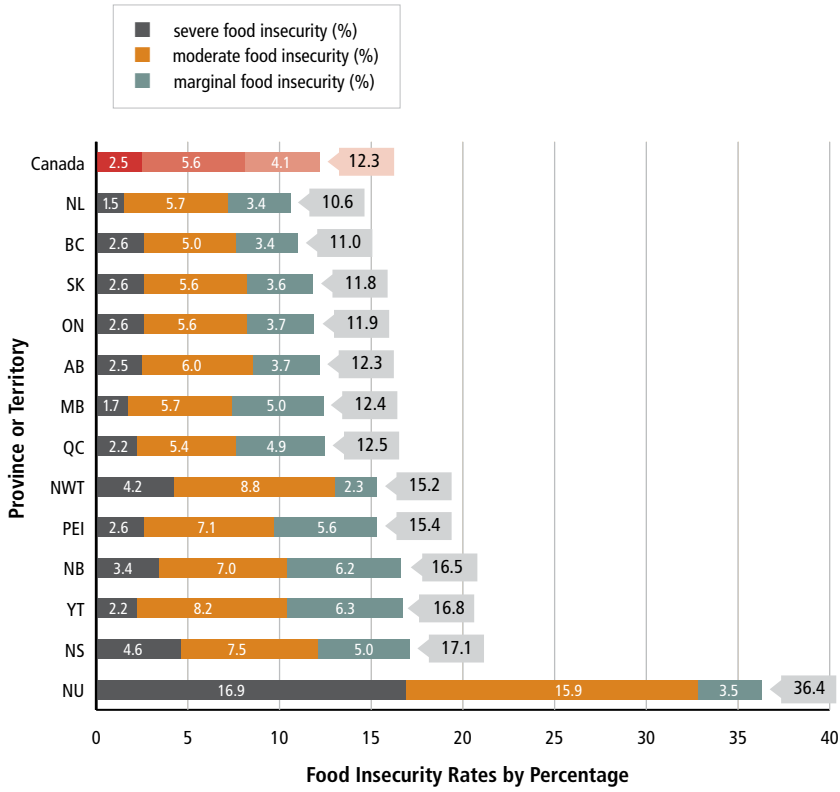
First Nations people have "high levels of vulnerability" to food insecurity.[10] CCHS data from 2011, as reported by Tarasuk *et al.* (2013), show that 12.3% of Canadian households experienced some level of food insecurity in the previous 12 months. Results indicate that the highest prevalence of food insecurity is in Nunavut, with 36% of households food insecure. Food insecurity rates exceeded 15% in the Maritimes, the Northwest Territories, and Yukon (see Figure 3.1). Newfoundland and Labrador had the lowest prevalence of food insecurity (10.6%).

Table 3.1 shows the prevalence of total (marginal, moderate, and severe) food insecurity in the provinces and territories between 2005 and 2011.[11] Rates in 2011 were generally equal to or higher than those in 2005. In 2011 food insecurity in Nova Scotia, New Brunswick, Quebec, Saskatchewan, and Alberta had the highest rates ever recorded in these provinces. Newfoundland and Labrador presented an anomaly; food insecurity has been declining there since 2005, to the point that the province demonstrated the lowest prevalence of food insecurity in Canada as of 2011.

From their review of 2011 CCHS results, Tarasuk *et al.* (2013) found that important household characteristics associated with a higher likelihood of food insecurity include having social assistance as the household's major source of income (about 65% of these households were food insecure), reliance on Employment Insurance or Worker's Compensation (37%), being a female lone parent (35%), having an income below the Low Income Measure (33%), being Aboriginal (27%), and renting as opposed to owning one's home (25%) (see Figure 3.2).

10 Through the Canadian Institutes of Health Research-sponsored initiative called *PROOF – Research to identify policy options to reduce food insecurity*, Tarasuk and colleagues gained advance access to 2011 CCHS results. The Panel analyzed these data in this report. The CCHS results reported by Tarasuk *et al.* in 2013, however, are higher than earlier estimates of the number of people living in food insecure households in 2007–2008 as provided by Health Canada. Tarasuk *et al.* recognize that while the prevalence of food insecurity in Canada increased between 2007–2008 and 2011, their research team also calculated the totals differently than Health Canada. They considered all members of households classified as food insecure, whereas Health Canada reported on food insecurity among those aged 12 and older. In addition, while Tarasuk and colleagues included marginally food insecure households in their calculations, Health Canada's earlier reports limited counts to those living in moderate or severely food insecure households. Tarasuk *et al.* point out that their prevalence estimates encompass a broader spectrum of the population affected by food insecurity, and that a growing body of literature suggests that "households reporting some level of uncertainty over food access are more vulnerable than those who affirmed no items on the 18-item questionnaire."

11 The HFSSM was included in the CCHS 2004 survey, but results are not comparable with subsequent surveys. Consistent, comparable data have been collected since 2005 when Canada began monitoring food insecurity.



Adapted and reproduced with permission from Tarasuk *et al.*, 2013
Data Source: Statistics Canada's Canadian Community Health Survey data, 2011

Figure 3.1

Household Food Insecurity in Canada by Province and Territory, 2011

Canadian Community Health Survey data estimates are reflected in this graph, which shows rates of marginal, moderate, and severe food insecurity* in households across Canada. Food security status is measured using the Household Food Security Survey Module (HFSSM), which focuses on "self-reports of uncertain, insufficient, or inadequate food access, availability and utilization due to limited financial resources, and the compromised eating patterns and food consumption that may result" (Health Canada, 2008). Please note that estimates may not add due to rounding.

* Since 2004, the 18-question HFSSM has been used by the CCHS to monitor household food insecurity. The adult scale has 10 questions, and the child scale has 8 questions. In the HFSSM, marginal food insecurity means some indication of worry or an income-related barrier to adequate, secure food access (one affirmative response to the questions for adults and/or children). Moderate food insecurity is indicated by compromise in quality and/or quantity of food consumed (two to five affirmative responses to the questions for adults, and two to four for children). Severe food insecurity is indicated by reduced food intake and disrupted eating patterns (six or more affirmative responses for adults, and five or more for children).

Table 3.1

Household Food Insecurity in Canada, 2005–2011

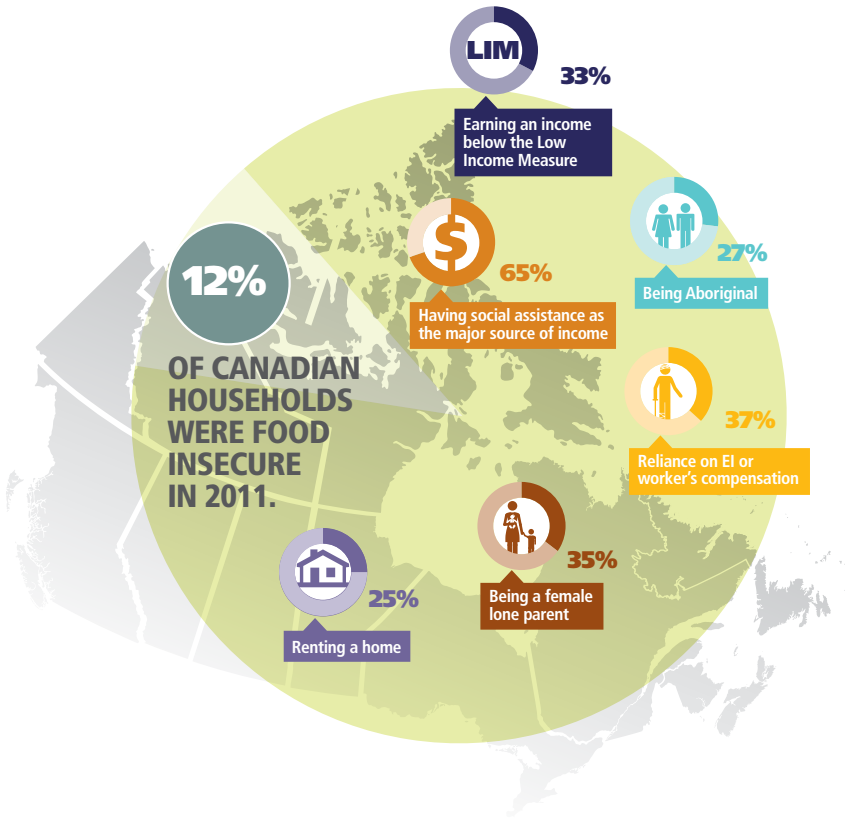
	2005	2007	2008	2009	2010	2011
Newfoundland & Labrador	–	15.7%	14.3%	11.8%	11.5%	10.6%
Prince Edward Island	12.9%	14.9%	15.3%	–	–	15.4%
Nova Scotia	16.1%	14.4%	13.5%	15.9%	14.9%	17.1%
New Brunswick	–	13.8%	15.1%	–	–	16.5%
Quebec	11.3%	10.9%	9.4%	11.3%	9.7%	12.5%
Ontario	11.6%	11.8%	12.1%	12.5%	11.3%	11.9%
Manitoba	–	12.4%	12.9%	10.8%	10.0%	12.4%
Saskatchewan	–	9.5%	9.7%	8.2%	9.2%	11.8%
Alberta	10.4%	9.1%	10.0%	10.8%	10.9%	12.3%
British Columbia	11.0%	10.8%	11.5%	11.9%	11.1%	11.0%
Yukon	–	17.8%	13.0%	13.9%	12.6%	16.7%
Northwest Territories	14.2%	16.5%	17.8%	9.8%	12.0%	15.2%
Nunavut	38.0%	35.4%	34.6%	31.0%	31.0%	36.4%

Reproduced with permission from Tarasuk *et al.*, 2013
Data Source: Statistics Canada, CCHS, 2005, 2007, 2008, 2009, 2010, 2011

The Household Food Security Survey Module is not always included in the Canadian Community Health Survey. During cycles where it has been optional, some provinces and territories have opted out of participation, hence the data gaps. Beginning in 2015, the module will be collected over a two-year time span, every four years.

While northern Canada is home to many culturally diverse populations, including northern-born multi-ethnic persons and southerners who have migrated to the North (GRID-Arendal, 2009), this assessment focuses on the food security and health of northern Aboriginal peoples. Compared with the prevalence of 7% in the non-Aboriginal population, 27% of Inuit, 22% of First Nations people living off-reserve, and 15% of Métis reported being food insecure from 2007–2010 (Gionet & Roshanafshar, 2013), and in 2011, households where the respondent identified as Aboriginal had a rate of food insecurity more than double (27%) that of all Canadian households (12%) (Tarasuk *et al.*, 2013).

The three large-scale surveys that provide the most comprehensive overviews of food insecurity in northern Canada are the First Nations Regional Health Survey (FNRHS), the Nunavik Inuit Health Survey (2004), and the IPY Inuit Health Survey (2007–2008). For example, from 2008 to 2010, over 21,000 individuals in 216 First Nations communities across Canada responded to the FNRHS. Based on survey results, 52.4% of First Nations households were categorized as moderate or severely food insecure, leading to the conclusion that "First Nations households



Data Source: CCHS, 2011, as presented in Tarasuk *et al.*, 2013

Figure 3.2

Likelihood of Household Food Insecurity in Canada, 2011

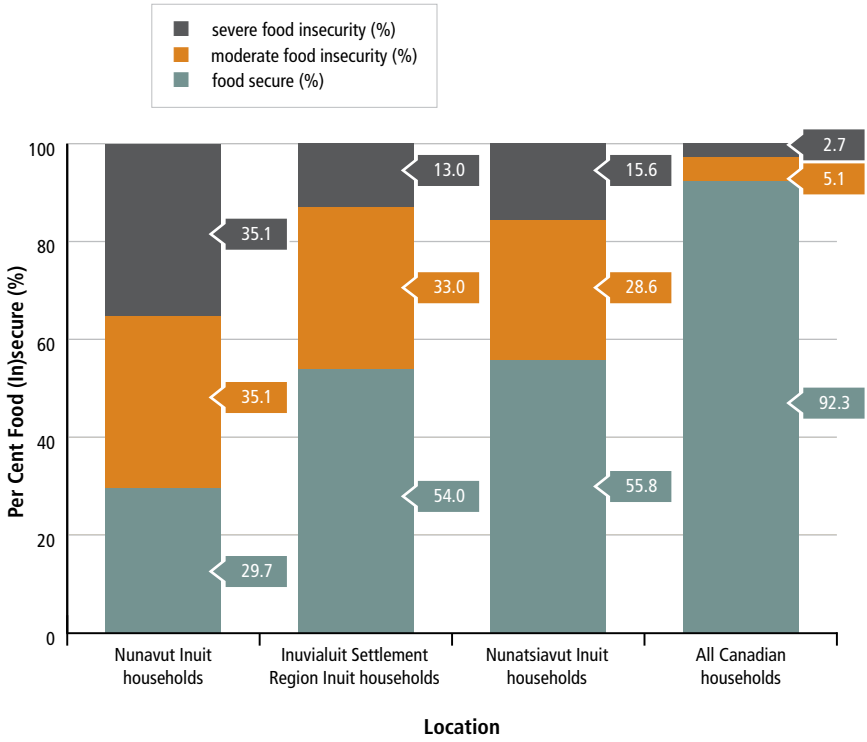
While Canadian Community Health Survey results from 2011 indicated that about 12% of households experienced some level of food insecurity, the likelihood of household food insecurity varied according to selected social determinants. For example, 35% of households headed by a female lone parent were food insecure, as were 27% of households where the respondent identified as Aboriginal. Statistics Canada's Low Income Measure (LIM) is often used as a proxy for poverty, as well as for making international comparisons. As Tarasuk *et al.* (2013) explain, the LIM is 50% of median household income, adjusted for household size. This adjustment accounts for the increased household needs that come with increased household size. In Canada, the lower household income is in relation to the LIM, the greater the prevalence of food insecurity. As shown in this figure, about 33% of households with incomes below the LIM were food insecure. Please note this figure excludes LIM results for the territories because the Survey of Labour and Income Dynamics (from which the LIM is derived) excludes the territories.

in First Nations communities are considerably more food-insecure — and more severely food insecure — than the general Canadian population" (FNIGC, 2012). Up to 33.8% of respondents indicated that they sometimes could not afford to eat balanced meals, and up to 14.1% reported that they often could not afford to eat balanced meals. Further, up to 17.8% of respondents reported that they had been hungry but did not eat due to a lack of money for food (FNIGC, 2011). Rates of food insecurity were more pronounced among adult respondents in the 16 communities of the Dene Nation of the NWT: from 2008 to 2010, more than 90% of the 824 respondents indicated that in the 12 months before the survey, they or other adults in their household either had cut the size of their meals or skipped meals, were hungry but did not eat, or ate less than they felt they should — in all cases, due to a lack of money for food (Dene Nation, 2012). Similarly, findings from the Nunavik Inuit Health Survey indicate that as of 2004, 24% of Inuit across the 14 villages of Nunavik lacked food during the month before the survey; rates of food insecurity increased with the number of people in the household (Blanchet & Rochette, 2008).

The IPY Inuit Health Survey (2007–2008) represents the most comprehensive assessment to date of food insecurity among the Inuit in the Canadian Arctic (Egeland *et al.*, 2011a). It identified 62.6% of the surveyed 1,901 Inuit households as food insecure, with 27.2% severely food insecure (Huet *et al.*, 2012), in comparison with 7.7% of households nationally (Health Canada, 2008). Adults living in households identified as severely food insecure reported instances in the previous year when they or other adults in their household had skipped meals (88.6%), gone hungry (76.9%), or not eaten for an entire day (58.2%) (Rosol *et al.*, 2011). Figure 3.3 illustrates regional levels of food insecurity across Nunavut, the ISR, and Nunatsiavut.

While IPY Inuit Health Survey results are important for Northerners, health experts, and policy-makers, findings also have global significance. "Nunavut," Egeland points out, had "by far the highest documented food insecurity prevalence rate (68.8%) for any Indigenous population residing in a developed country" (Egeland, 2011). Unemployment, low income, and high food costs have been cited as the main reasons for food insecurity across Nunavut, the ISR, and Nunatsiavut (see Egeland 2010a, 2010b, 2010c), and isolated northern communities within the provinces (see Lawn & Harvey, 2004). Egeland (2011) attributes the higher rates of food insecurity in Nunavut to the particularly pronounced levels of economic hardship (e.g., limited incomes and high food costs) prevalent in that territory.

Research shows that rates of food insecurity are generally and consistently high despite dissimilarities of communities — from two-thirds of First Nations households in Fort Severn, Ontario (Lawn & Harvey, 2004) to 79% of Inuit households in Kugaaruk, Nunavut (Lawn & Harvey, 2009). In 14 communities



Data Source: Egeland, 2010a, 2010b, 2010c; Health Canada, 2008

Figure 3.3

Prevalence of Household Food Insecurity Across Northern Regions and Canada, 2007–2008

Data show food insecurity among Inuit households in Nunavut, the Inuvialuit Settlement Region, and Nunatsiavut (data from IPY Inuit Health Survey using a modified Household Food Security Survey Module (HFSSM) survey tool as presented in Egeland, 2010a, 2010b, 2010c), as well as food insecurity among all Canadian households in 2007–2008 (data from Canadian Community Health Survey, 2007–2008 using the HFSSM survey tool as presented in Health Canada, 2008). Proportions are shown within the bars (numbers may not add due to rounding). Nunavik Inuit Health Survey and First Nations Regional Health Survey results are not included because they used a different methodology to collect the data (i.e., different questions were asked), rendering the data unfit for direct comparisons.

in northern Manitoba that lacked all-weather roads or were located north of the city of Thompson, 75% of households reported being food insecure (Thompson *et al.*, 2011).[12] Of these households, 42% were moderately food insecure and 33% were severely food insecure. Rates of food insecurity varied "dramatically" from one community to the next, from 47% in Nelson House to 100% in South Indian Lake First Nation, for example (Thompson *et al.*, 2011).

12 An adult and/or a child experienced food insecurity in each of these households (Thompson *et al.*, 2011).

Other surveys have recorded food (in)security data in First Nations and Inuit communities in northern Canada (Willows *et al.,* 2005; Chan *et al.,* 2006; Ford *et al.,* 2007; Ford & Berrang-Ford, 2009). Little is known, however, about the experience of food insecurity among Métis populations in northern Canada, due to a lack of available peer-reviewed information, community studies, and grey literature, which may be housed in communities but difficult to access.

3.1.1 Food Bank Use

Data on food bank use also illustrate the state of food insecurity in Canada. According to a Food Banks Canada survey (ultimately resulting in the *HungerCount 2011* report) that included 4,188 food banks and agencies from across Canada, national rates of food bank use in 2011 were the second highest on record (FBC, 2011). The use of Canadian food banks increased by 2.4% in 2012, and use is now 30.6% higher than it was prior to the 2008–2009 recession. The *HungerCount 2012* report highlights that in a typical month, food banks across the country provide food to more than 882,000 people. Of those helped, 38% are children, despite the fact that they represent 21% of the Canadian population. Demographically diverse groups are assisted by food banks, but due in part to "prolonged and stubborn economic disadvantage," disproportionate use of food banks is demonstrated by households receiving social assistance, single parent-headed households, and Aboriginal people (FBC, 2012). The increase in food bank use from 2008 to 2011 appears to be particularly pronounced in the three territories, where use increased by 80.6% (compared with 25.9% across Canada). In 2011 food banks assisted 2,420 people in the territories, of which 72% were Aboriginal (compared with the national average of 9.7%). Rural food banks in the western provinces also had higher-than-average proportions of Aboriginal clients, from 27% in British Columbia to 64% in Saskatchewan.[13] In the 2012 data, First Nations, Métis, and Inuit account for 4% of the Canadian population, yet comprise 11% of the individuals using food banks. As Jen Hayward of the Niqinik Nuatsivik Nunavut Food Bank expresses, "A person shouldn't have to stand in a grocery store and think, 'should I buy bread or milk this week with my $10' because they can't afford both" (FBC, 2012).

HungerCount 2012 has recommended the creation of a federal Northern Food Security Innovation Fund to help address the egregiously high levels of household food insecurity in the territories (FBC, 2012). Food Banks Canada also suggests that the level of food bank use in northern Canada reported in *HungerCount 2012* is not a reliable indicator of the need for emergency food, since so few food banks exist there in the first place. The organization suggests this is not a function of a lack of need in the territories and northern regions of the provinces, but the

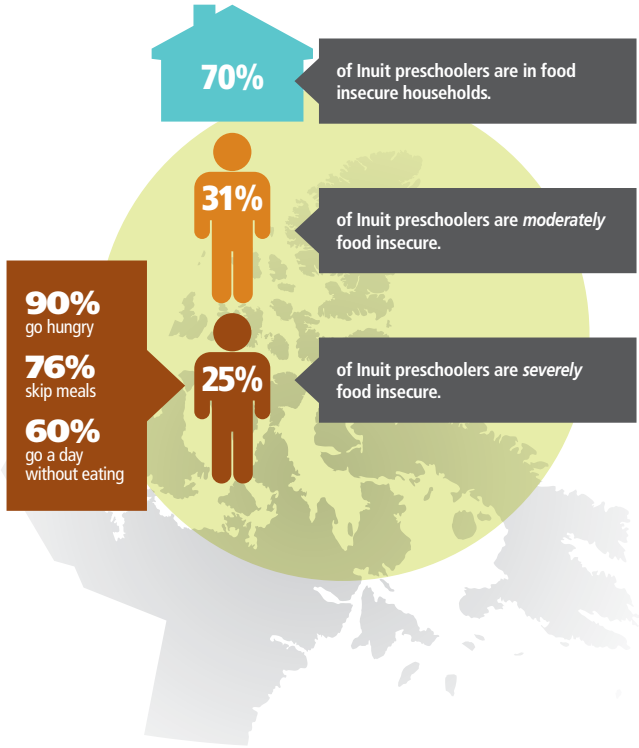
13 No data were available from Manitoba.

consequence of a simple lack of resources. The two most important sources of support for food banks are a sufficient donor base and a quantity of surplus food from grocery retailers and distributors; these sources are relatively absent in the North, as the small population base simply does not provide for them (FBC, 2012).

3.1.2 Children and Women

Some demographic groups are at higher risk of food insecurity than others, underscoring the need to identify how and where interventions may be activated to strengthen northern food systems. As noted previously, although food insecurity is a problem across the Canadian North, clear variations exist in levels of food insecurity among regions, communities, and population groups. For example, data indicate that Canadian households with children have a higher prevalence of food insecurity than households without children (Tarasuk *et al.,* 2013). Kirkpatrick *et al.* (2010) found that among Canadian children in general, the odds of experiencing hunger increased with the age of the child, the number of children in the home, and whether a child had ever lived in a rented (as opposed to owned) dwelling. Odds were lower with increasing household income.

Although Kirkpatrick *et al.* (2010) report that about 3% of Canadian children in general have experienced hunger, CCHS data (2011) indicate that 17% of all children under the age of 18 live in food insecure households. About two-thirds of these children were in moderately or severely food insecure households. Nunavut had the highest prevalence of children living in food insecure households, at 57% (Tarasuk *et al.*, 2013). Specific to northern Canada, results from the Nunavut Inuit Child Health Survey (2007–2008) show that compared with child food secure homes, child food insecure homes had, on average, a greater number of persons living in the home (6.1 compared with 5.5), and a tendency for a greater ratio of children to adults (1.7 compared with 1.5). Living in a crowded household (58.9% compared with 44.6%), living in public housing (87.0% compared with 50.3%), having a home in need of major repairs (40.7% compared with 28.5%), and having a family member on income support (57.9% compared with 27.7%) represent other household characteristics that varied by food security status, all of which were significant at the $p \leq 0.10$ level or less (Egeland *et al.*, 2011). A synthesis of these results is presented in Figure 3.4. Using a parent-reported measure of hunger status (as opposed to food insecurity), Findlay *et al.* (2013) found that 24.4% of Canadian Inuit children aged two to five had experienced hunger at some point in their lives.



Data Source: Nunavut Inuit Child Health Survey, 2007–2008, as presented in Egeland *et al.*, 2010

Figure 3.4

Food Insecurity Among Inuit Preschoolers in Nunavut, 2007–2008

As demonstrated by the data presented here, child food insecurity is a serious problem in Nunavut.

Findings from the 2007–2008 Nunavut Inuit Child Health Survey[14] indicated that nearly 70% of Inuit preschoolers aged three to five lived in food insecure households, and 56% lived in households with child-specific food insecurity. Overall, 31% of children in Nunavut were moderately food insecure, and about one-quarter were severely food insecure (Egeland *et al.*, 2010). Similar results were found in the 2006 Aboriginal Peoples Survey:[15] in Canada 30% of Inuit children aged 6 to 14,

14 The Nunavut Inuit Child Health Survey, a cross-sectional survey of the health of 388 preschool-aged Inuit children in 2007–2008 across 16 of the 25 communities in Nunavut, asked questions specific to whether participants had the financial means to buy groceries and did not cover access to traditional Indigenous food systems.

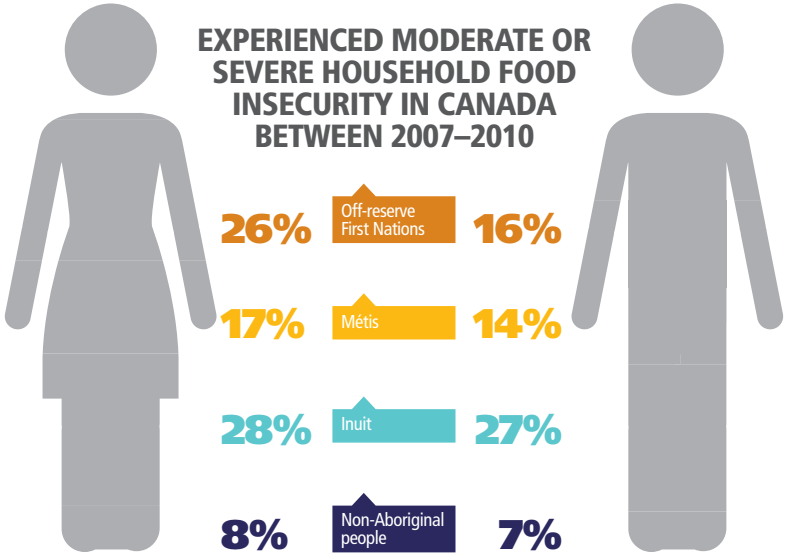
15 Not including Aboriginal populations on-reserve or those living in First Nations communities in the territories.

and 7% of Métis children, had experienced hunger[16] at some point because their families had run out of food or money to buy food (Tait, 2008; NCCAH, 2011). The percentage of Inuit children aged 6 to 14 who had experienced hunger varied across the North, from 39% in Nunavut to 33% in Nunavik, 30% in Nunatsiavut, 12% in the ISR, and about 8% outside of Inuit Nunangat (Tait, 2008).

In response to food scarcity, primary caregivers in Inuit households where children were severely food insecure reported that their children remained hungry (90.4%), skipped meals (75.8%), or went an entire day without eating (60.1%) within the past year (Egeland *et al.*, 2010). In Inuit households where children were moderately food insecure, primary caregivers reported occurrences in the past year where they fed their children less expensive food (95.1%), they worried that food would run out (85.1%), and their children did not eat enough because of a lack of money for food (64.3%). Parents of Métis children in the *Aboriginal Peoples Survey* reported skipping meals or eating less food (17%), seeking assistance from relatives (35%) or friends (14%), and/or using food bank services (33%) to cope with food insecurity (Statistics Canada, 2009, as reported in NCCAH, 2011).

Though limited, preliminary research indicates that food insecurity is also higher among women (Ledrou & Gervais, 2005; Lambden *et al.*, 2006). In their exploratory analysis of food insecurity involving 50 Inuit in Igloolik, Nunavut, Ford and Berrang-Ford (2009) found that 64% of participants surveyed had experienced some degree of food insecurity the previous year, a rate that greatly exceeds the Canadian average. Female respondents were more likely to be food insecure (80%) than were men (53%). Women were also significantly more likely than men to reduce the size of their meals or skip meals, go hungry due to lack of food, or not eat for an entire day. Of those women who reported not eating for a day, 43% indicated that this was generally a monthly occurrence, compared with 29% of men (Ford & Berrang-Ford, 2009). CCHS results from 2007–2010 also show a higher percentage of women than men experienced moderate or severe household food insecurity among off-reserve First Nations populations (26% of women versus 16% of men), Métis (17% versus 14%), Inuit (28% versus 27%), and the general population (8% versus 7%) (Gionet & Roshanafshar, 2013) (Figure 3.5).

16 Parents of children were asked, "Has (the child) ever experienced being hungry because the family has run out of food or money to buy food?" (Tait, 2008).



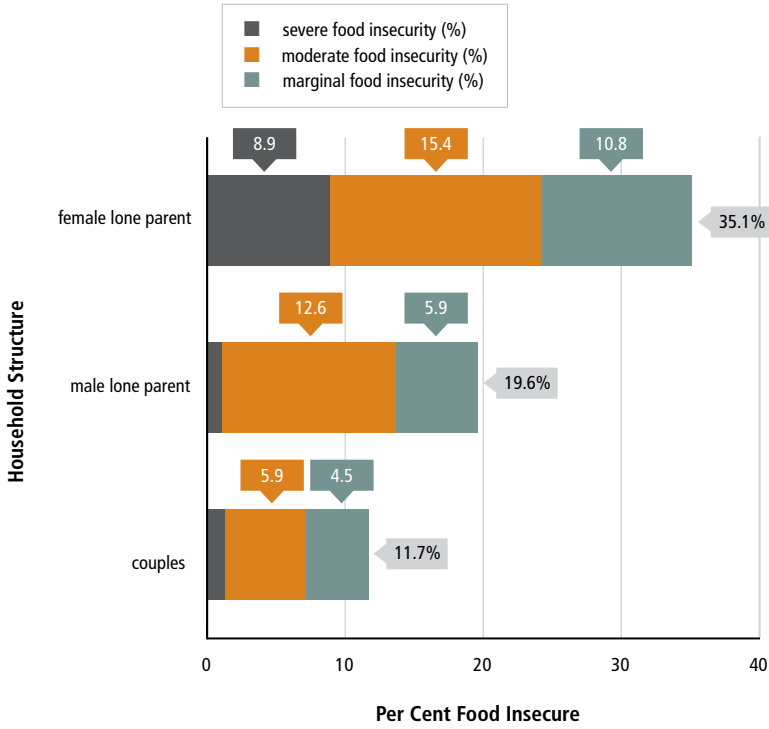
Data Source: Gionet & Roshanafshar, 2013

Figure 3.5

Indigeneity, Gender, and Food Insecurity

Aggregated data from the 2007–2010 Canadian Community Health Survey indicate that among off-reserve First Nations populations, Métis populations, Inuit populations, and non-Aboriginal people, women are slightly but consistently more likely than men to be food insecure. In all cases, Aboriginal women are statistically significantly more likely to be food insecure than non-Aboriginal women in Canada.

While the percentage of difference portrayed in Figure 3.5 is small in some cases, the finding remains consistent that more women experience household food insecurity than men. A contributing factor may be that single-parent families are more likely to be headed by women (Gionet & Roshanafshar, 2013). However, across Canada in 2011, CCHS results (as reported by Tarasuk *et al.*, 2013) indicate that female lone parent-headed households had higher rates of food insecurity (35.1% total) than did male lone parent-headed households (19.6% total) or couple-headed households (11.7% total) (see Figure 3.6).



Adapted with permission from Tarasuk *et al.*, 2013

Figure 3.6

Household Social Structure Affects Food Security Status in Canada

Estimates from the 2011 Canadian Community Health Survey indicate that across all three categories of food insecurity, female lone parent-headed households are more likely to be food insecure than male lone parent-headed households or couple-headed households.

Based on their work in Nunavut, Beaumier and Ford (2010) argue that more research is required to assess the relationships between gender and food insecurity. They recommend that this should be part of longer-term public health strategies and climate change planning to ensure Inuit have comparable health to all Canadians. While in agreement with this finding, the Panel added that gender-based analyses of food insecurity among all northern Aboriginal peoples, as well as the broader Canadian population, are essential.

3.2 FOOD SECURITY AND LINKS TO HEALTH

As illustrated in the Panel's conceptual framework (Figure 2.1), a reciprocal relationship exists between food security and health and wellness. Health can be an enabler of, or a barrier to, food security, as well as an outcome of being food secure.

A number of measures are generally used to monitor the physical health of a population, including birth weight, life expectancy, infant mortality rate, and perinatal mortality rate. Population health can also be assessed by the relative level of common diseases in a community, such as infectious disease, heart disease, diabetes, and respiratory illness. Many of these indicators have clear links to food security. For example, people who are food insecure are more susceptible to malnutrition, infection, and chronic health problems, and tend to be preoccupied with food access, feel a loss of control, and struggle psychologically (Lambden *et al.*, 2006). The consequences of food insecurity include chronic health issues such as obesity and anemia, child developmental issues, and stress on parents and caregivers (Butler Walker *et al.*, 2009). Further, the mental health effects of food insecurity include reduced ability to learn, depression, and social exclusion. Physical injury is also a consideration when discussing the relationship between health and food security, with regard to the potential risks of subsistence harvesting in a changing environment (Nickels *et al.*, 2005).

Recognizing that a wide range of health indicators exist in a large body of health literature, the Panel determined it was important to highlight a concise selection of health indicators relevant to food security to provide a better understanding of the factors that contribute to, and are outcomes of, food security (e.g., daily protein intake from market food versus traditional/country food). This section frames food security as a determinant of health through a focus on health indicators. It also identifies current knowledge gaps in this area, particularly as they pertain to nutrition and environmental health. Much of the data are based on Canadian Aboriginal people, although some recent studies are specific to northern Aboriginal peoples (e.g., Lix *et al.*, 2009; Sarkar *et al.*, 2010). The Panel noted that while data on the health of Canadian Aboriginal people are informative to this assessment, disease patterns and the distribution of risk factors differ between northern and southern Canadian Aboriginal communities. Where possible, the data reported here are from northern Aboriginal communities. If these data are unavailable, national statistics are reported instead.

The CCHS provides key information on many aspects of Canadians' health and also includes questions on Aboriginal identity for First Nations, Métis, and Inuit. The Health Statistics Division of Statistics Canada merged the annual cycles of the CCHS from 2007 to 2010 to create two data tables that cover a range of health indicators for First Nations, Métis, and Inuit, along with the non-Aboriginal population. The CCHS has been used to describe the health of Aboriginal people from its very beginnings; however, Aboriginal people living on reserves and in the Quebec health regions of Région du Nunavik and Région des Terres-Cries-de-la-Baie-James are excluded. Also, the survey coverage is limited to the 10 largest communities in Nunavut, which represent about 70% of the population.

Surveillance data are recognized as measures of food security, but are not widely available or comparable with other data. Currently, surveillance data to monitor food insecurity can be collected using various measures, such as questionnaire-driven surveys. The caveat in these surveys is that the data on food insecurity are not collected in standardized ways that would enable comparisons. However, the World Health Organization's (WHO) standard of food insecurity in the international context refers to anthropometric measures of height, weight, and body mass index (BMI) for children and adults in a particular community over time, to assess under- and over-nutrition (obesity). The emphasis in these studies is on recognizing under-nutrition, including malnutrition, underweight, and stunting. As a result, the lack of comprehensive surveillance data on the health of Aboriginal peoples across the Canadian North poses similar challenges to those of measuring food security (recall the earlier discussion on coordinating data sets that cover different populations).

Already-noted examples of major Canadian data sets measuring the health of Aboriginal people include the FNRHS (on-reserve First Nations populations); Statistics Canada's Aboriginal Peoples Survey (Inuit, Métis, and off-reserve First Nations, excluding some First Nations communities in Yukon and NWT); the Nunavik Inuit Health Survey (Inuit populations in Nunavik); and the IPY Inuit Health Survey (Inuit populations in the ISR, Nunavut, and Nunatsiavut). To complement some aspects of the Aboriginal Peoples Survey, the First Nations Information Governance Centre (FNIGC) has partnered with AANDC on the fourth generation of the Survey on Aboriginal Peoples (FNIGC, 2013). The First Nations Regional Early Childhood, Education and Employment Survey (FNREEES) will be conducted by the FNIGC with First Nations living on reserve and in northern First Nations communities across Canada. Results from this survey are expected to be released in 2015 (AANDC, 2011).

Data indicate that while the overall health status of Aboriginal people in Canada is not on par with the general Canadian population, significant improvements have been made in various aspects of Aboriginal health, as demonstrated by decreasing infant mortality rates and the levelling off of communicable diseases (Gionet & Roshanafshar, 2013). However, life expectancy at birth for Nunavut residents has been reported as 10 years lower than for the rest of Canada (NRCHI, 2004), and life expectancy in Nunavik in 2003–2004 was 63 years, compared with 79 years in the rest of Quebec (Donaldson *et al.*, 2010). Rates of chronic disease and injuries have increased, and strategies for effective prevention and control remain elusive.[17] The Panel was reluctant to draw direct causal effects between the nutrition transition and health in some cases, such as in some chronic diseases like tuberculosis, for which cases are rising (the rise of tuberculosis can be affected by overcrowded housing, smoking, and less immunological resilience due to poorer health conditions).

At the national level, Aboriginal people are more likely than non-Aboriginal people to have at least one chronic condition and specific conditions such as cardiovascular disease and diabetes, even when differences in socio-demographic characteristics are taken into account (Monsalve *et al.*, 2005; Tjepkema, 2006). The data are slightly different for Aboriginal people in northern Canada, who in 2000–2001 were less likely than Aboriginal people in southern Canada to report a chronic condition because of limited access to medical services, not because of a reticence to report (Lix *et al.*, 2009). In addition, some diseases, including heart disease, hypertension, and diabetes, are lower in northern communities than in the rest of Canada, although limited comparisons dealing with multiple diseases exist (Deering *et al.*, 2009). By 2005–2006, however, the odds of reporting several health risk factors had increased among Aboriginal peoples in the North; differences in the prevalence of chronic diseases between northern and southern Aboriginal populations were found to be less pronounced (Lix *et al.*, 2009).

Injury rates among northern Aboriginal peoples are relevant to food security because northern Aboriginal peoples who hunt and gather may be at higher risk of injury due to the nature of subsistence harvesting (see Chapter 5). Further, Tjepkema (2005) reports that although non-fatal injuries are an important health concern for all Canadians, mortality and morbidity due to injury are disproportionately high among Aboriginal people. Inuit teenagers and children

17 See First Nations and Inuit Health links on Health Canada's website: http://www.hc-sc.gc.ca/fniah-spnia/pubs/aborig-autoch/index-eng.php.

are particularly implicated; from 2004 to 2008, injuries were responsible for 64% of deaths of children and teenagers in Inuit Nunangat, compared with 36% in the rest of Canada (Oliver *et al.*, 2012).

Not enough research has been conducted that explores the variation of chronic diseases and their risk factors in the populations of northern Canada. Nonetheless, it appears that the physical and mental health of northern Aboriginal populations is declining, in comparison with Aboriginal people in southern Canada and non-Aboriginal people in both regions (Lix *et al.*, 2009). The following paragraphs highlight the relationships between several of these health indicators and food security for northern Aboriginal peoples.

Self-rated health: General health status can be measured in a health survey by asking respondents to categorize their own health on a five-point scale, ranging from "poor" to "excellent." It has demonstrated its validity as an indicator of health, with the potential to predict health outcomes such as mortality, morbidity, and use of health services (Young, 2012). Overall, the self-rated health of Aboriginal people is lower than that of the general population (Health Canada, 2004). Through the CCHS, Statistics Canada (2010b) reported that as of 2006, 60% of Canadians reported excellent or very good health, compared with 53% of First Nations people living off reserve, 40% of First Nations people living on or near a reserve (NAHO, 2003), 58% of adult Métis (Statistics Canada, 2010b), and 47% of Inuit (Statistics Canada, 2006b). These disparities may be indicative of the poor socio-economic and health conditions present in some Aboriginal communities (FNMIGBA, 2009).

Nutrition: Food insecurity is directly related to lower healthy eating index scores, reflecting a decreased consumption of vegetables and fruits, grains, and dairy products, and an increased intake of energy from sugary food (Huet *et al.*, 2011). Food insecurity was also negatively associated with iron stores in both men and women participating in the Inuit Health Survey (Saudny *et al.*, 2012; Jamieson *et al.*, 2012).

Northern Aboriginal peoples consume a mixed diet of market food and traditional/country food. The nutrition transition from traditional/country food to market food is discussed at length in Chapter 7. Donaldson *et al.* (2010) reviewed results of eight studies and revealed that traditional/country food contributed 4.3 to 89% of total energy intake, with a median value of 18% (percentages vary by geographic location, urban/rural status, community, household, and individual). Traditional/country food, however, is also a key source of nutrients such as proteins, vitamins, and minerals (Kuhnlein *et al.*, 2002). For example, an increase in traditional/country food intake correlates

with an increase in the intake of protein, vitamins D and E, riboflavin, vitamin B6, iron, zinc, copper, magnesium, manganese, potassium (Donaldson *et al.*, 2010), and other micronutrients (Kuhnlein *et al.*, 2004; Nakano *et al.*, 2005). There is also evidence that traditional/country food can lower the risk of some types of cardiovascular disease and contaminant toxicity (Blanchet *et al.*, 2000; Van Oostdam *et al.*, 2005). The nutrition transition towards market-based diets, which involves declining use of traditional/country food and increased intake of low-nutrient, high-energy market food, can increase the risk for diet-sensitive chronic diseases and micronutrient deficiencies in Aboriginal communities (Guyot *et al.*, 2006; Donaldson *et al.*, 2010; Egeland *et al.*, 2011a).

Obesity/overweight: Obesity is recognized as a major public health problem in Canada (PHAC & CIHI, 2011), and the rates are high among Aboriginal people (Lix *et al.*, 2009; Willows *et al.*, 2012). From 2007 to 2010, obesity rates for First Nations (26%), Métis (22%), and Inuit (26%) were higher than for non-Aboriginal Canadians (16%).[18] However, all groups had similar rates for the overweight category. Health-related weight issues are also demonstrated in Aboriginal children. IPY Inuit Health Survey results from Egeland *et al.* (2010) indicate a high prevalence of overweight (39.3%) and obesity (28.0%) among Inuit children aged three to five, and 2008–2010 Regional Health Survey results report that 62.3% of on-reserve First Nations children were overweight or obese (FNIGC, 2011). Several studies have linked overweight and obesity with food insecurity[19] (Townsend *et al.*, 2001; Casey *et al.*, 2006; Metallinos-Katsaras *et al.*, 2012), which may be reflective of the increasing availability and consumption of nutrient-poor, energy-dense, low-cost market food in northern Aboriginal communities (Kuhnlein *et al.*, 2004; Downs *et al.*, 2009; Egeland *et al.*, 2009a; Sheikh *et al.*, 2011).

Diabetes: Diabetes is one of many health issues related to weight. Most people with diabetes are overweight or obese, and Aboriginal people face a high risk of developing the disease (CDA, 2012). Although diabetes was rare among the Canadian Aboriginal population in North America prior to 1940, it has now reached epidemic levels in some communities (Bruce *et al.*, 2003; Young *et al.*, 2000). CCHS data from 2007–2010 suggest that First Nations people in particular are more likely to report being diagnosed with diabetes than non-Aboriginal people. This difference is most pronounced for those aged 45 and older, where 19% of

18 Although BMI is commonly used to assess a person's weight, there is debate on whether the same cut-offs are appropriate for Inuit because "BMI overestimates adiposity in individuals with a long torso relative to standing height" (Charbonneau-Roberts *et al.*, 2005, in Egeland *et al.*, 2009a).

19 Huet *et al.* (2012) note that discrepancies exist in studies on the extent to which food insecurity is associated with underweight and overweight. They point out that different outcomes are likely reflective of differences in the severity of food insecurity, relationships between body weight and poverty, ethnicity, sex, culture, and the stage of nutritional transition, among other factors.

First Nations people and 11% of the non-Aboriginal population are diabetic (Gionet & Roshanafshar, 2013). Despite a slight increasing trend shown in the National Diabetes Surveillance System data, the prevalence rate for diabetes in Nunavut is the lowest in Canada (Donaldson *et al.*, 2010). Among northern Aboriginal peoples, both Inuit and Dene people have lower prevalence than First Nations people in the provinces (Young *et al.*, 2000); however, this situation will likely change in the near future, as diets continue to transition toward market/imported food. Ensuring food security will play a role in averting future diabetes epidemics.

Cardiovascular disease: Heart disease and stroke are two of the three leading causes of death in Canada (HSFC, 2013). Aboriginal populations have higher acute myocardial infarction mortality and higher rates of risk factors for heart diseases than other Canadians (CIHI, 2013). First Nations populations are at an increased risk of coronary heart disease compared with other Canadians, in part due to higher rates of smoking, obesity, physical inactivity, and diabetes (CIHI, 2013). The connection between food insecurity and the poor nutritional quality of the diets with which they are associated, and the risk of cardiovascular disease is clear: cardiovascular disease risk is increased by trans fatty acids, high sodium and alcohol intake, and obesity, although the risk is decreased by regular physical activity, omega-3 fatty acids, vegetables and fruits, and low to moderate alcohol intake (Earle, 2011). Young *et al.* (2007) suggest that because the traditional Inuit diet contains high levels of omega-3 fatty acids from marine mammals and fish, consumption of this country food could decrease the negative effects of obesity on cardiovascular disease.

Mental health: Mental health is a two-way street when considering food security and food insecurity. Positive mental well-being supports food security in communities, whereas poor mental health leads to increased food insecurity. Positive mental health depends on individuals, families, and communities feeling connected to each other and to their past, present, and future, and to their culture and traditions. Rates of mental health problems such as suicide, depression, and substance abuse are significantly higher in many Aboriginal communities than in the general population (HCC, 2002). Of the respondents to the FNRHS across the Dene Nation, 84% reported alcohol and drug abuse as a concern in their community (Dene Nation, 2012).

Hunting and gathering activities and consumption of traditional/country food are considered beneficial to the physical and mental health of Inuit and other northern Aboriginal populations, both through the connection to land that hunting and gathering instils and to the cultural benefits of sharing, and nutritional benefits of consuming, traditional food (Myers *et al.*, 2004;

Chan *et al.*, 2006; Ferguson, 2011). Nickels *et al.* (2005) report the negative impacts of environmental changes on, for instance, sea-ice access routes to hunting areas, ice-road stability, and reliable transport of market foodstuffs. The Panel suggested that the combined effects on mental health may be attributed to the reduced ability of individuals to practice aspects of a traditional way of life, which impacts food security as a result of decreasing access to traditional/country food.

3.3 CONCLUSIONS

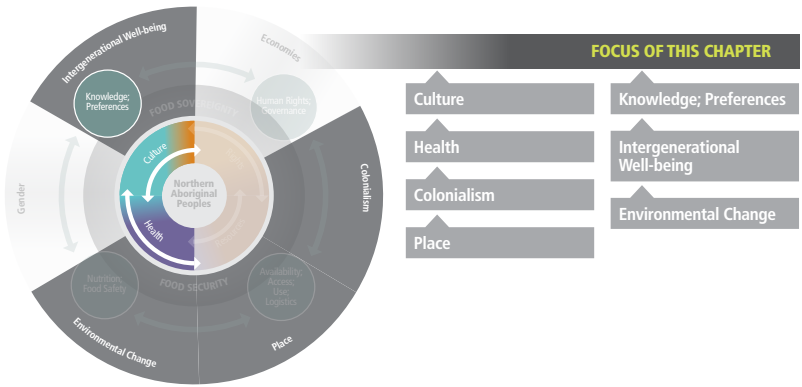
Food insecurity is a problem that is experienced across Canada, but it is felt more acutely in some populations than in others. The odds of household food insecurity increase with the presence of factors such as being a female lone parent, having an income below the Low Income Measure, being Aboriginal, renting as opposed to owning one's home, and receiving social assistance, Employment Insurance, and/or Worker's Compensation. Households with children report a higher prevalence of food insecurity, and preliminary evidence indicates that more women than men are affected. Food insecurity is linked to negative physical and mental health outcomes, including poor dietary quality, under-nutrition, obesity, chronic diseases, poor educational outcomes, and family stress. This serious public health issue has major impacts on individuals, families, communities, the health care system, and the economy.

4

People, Place, and Culture as Factors Affecting Food Security

- Peoples of Northern Canada: Demographic Information
- Aboriginal Health and Wellness
- The Place: Northern Canada
- Legacy of Environmental Dispossession
- Cultural Relevance of Traditional Knowledge
- Conclusions

4 People, Place, and Culture as Factors Affecting Food Security



Key Findings

Northern Canada is rich in cultural, ecological, geographic, topographic, and climatic diversity. Distinct cultures, communities, and individuals across this broad geographic area use different methods to achieve food security and food sovereignty.

Diverse groups of First Nations, Métis, and Inuit form a substantial proportion of the population of Yukon (23.1%) and NWT (51.9%) and the overwhelming majority of the population of Nunavut (86.3%). The need to respond to food insecurity becomes even more pronounced considering the Aboriginal population is young and quickly growing.

The consequences of environmental dispossession and colonialism have significantly affected and strained the social and cultural fabric of many Aboriginal communities. Together with unprecedented environmental changes, there are clear implications for local environmental knowledge, intergenerational knowledge transmission, and overall health and wellness in these communities today.

Taken together, Aboriginal perspectives of health and wellness are holistic, and individual and community health are understood to be interdependent and equally important. Health and wellness include mental, physical, spiritual, emotional, and social dimensions, and are connected to the quality of the land, air, and water. This perspective is particularly important for understanding the links between health and wellness, intergenerational well-being, food security, and food sovereignty.

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Traditional knowledge is an important enabler of food security among Aboriginal peoples, as well as a key information source that can inform understanding of food security in the North.

Intergenerational well-being and cultural well-being are both drivers and outcomes of food security. Rapid social, cultural, and environmental change for Aboriginal peoples in northern Canada are significant barriers to the uptake of traditional knowledge in these populations.

This chapter places food security in the context of demographics, place, and some aspects of Indigenous culture, including Indigenous knowledge practices. It briefly presents demographic information on the diverse Aboriginal peoples who live in the Canadian North and then describes the North itself, making reference to features that heighten this region's vulnerability to food insecurity. It introduces Indigenous holistic concepts of health and wellness, and discusses the relationships between culture, health, and food security, including reviewing traditional practices that promote food security. The legacy of environmental dispossession, and its associated effects on health, wellness, and food insecurity, is also discussed. The concluding section focuses on traditional knowledge as a community asset and enabler of food security, addressing topics such as knowledge about plant and animal wildlife species, harvesting, and food preparation. It also presents reflections on social change in the North, and the associated implications for food security and intergenerational well-being.

4.1 PEOPLES OF NORTHERN CANADA: DEMOGRAPHIC INFORMATION

In Canada, Indigenous peoples are often collectively referred to as Aboriginal peoples and are further identified through groupings inscribed into the Canadian Constitution: Inuit, Métis, and "Indian" or First Nations. These terms, in turn, are often used to collect and organize information. According to the National Household Survey (NHS), in 2011 over half of the 120,495 residents across the territories, Nunavik, and Nunatsiavut were Aboriginal (Statistics Canada, 2013a; 2013c). They include members of cultural groups such as Yukon First Nations; Dene, Métis, and Gwich'in of the NWT; and the Inuit of Nunavut and the ISR of the NWT.

As illustrated in Table 4.1, the make-up of the Aboriginal population in the Canadian North varies by region and cultural group. Across the locations represented in Table 4.1, Inuit represent the greatest share of the Aboriginal population in Nunavut, Nunavik (including northern Quebec), and Nunatsiavut

(in Labrador). According to the 2011 NHS, the majority (73.1%) of Inuit in Canada reside in the communities of Inuit Nunangat[20] where they also account for the majority of the overall population (Statistics Canada, 2013b). Inuit Nunangat is the Canadian Inuktitut expression for "Inuit homeland," which is composed of the four Inuit Land Claims Regions in northern Canada: the ISR, the territory of Nunavut, and Nunavik and Nunatsiavut (Statistics Canada, 2008). Despite the fact that Inuit Nunangat covers more than one-third of Canada's land mass, most of its 53 communities are remote and 38% have populations of less than 500 (ITK & ICC, 2012). There are 14 identified Inuit communities in Nunavik (northern Quebec), 26 in Nunavut, and 5 in Nunatsiavut (Labrador) (ITK, n.d.).

Also, as illustrated in Table 4.1, First Nations represent the greatest share of the Aboriginal population in the NWT and Yukon. In particular, there are 26 distinct First Nations in the NWT (AANDC, 2013d); 18 First Nations in Yukon (AANDC, 2013e); six communities are within the ISR (AANDC, 2010c). Métis also live across the territories, although their populations in these regions are significantly lower than those of First Nations and Inuit.

Table 4.1

Aboriginal Populations of Northern Canada, 2011

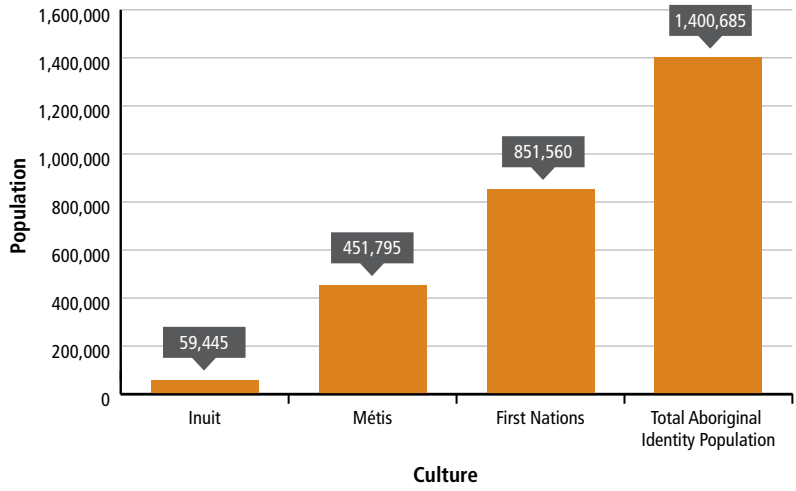
Location	First Nations	Inuit	Métis	Total Aboriginal Identity Population	Total Non-Aboriginal Population	Total (Aboriginal and Non-Aboriginal)
Nunavut	125	27,070	130	27,360	4,340	31,700
Northwest Territories	13,345	4,335	3,250	21,160	19,640	40,800
Yukon	6,585	180	845	7,710	25,615	33,325
Nunatsiavut	10	2,325	20	2,360	255	2,615
Nunavik	55	10,750	45	10,880	1,175	12,060

Data Source: Statistics Canada, 2013a; 2013c, using 2011 NHS data

*Note that due to random rounding, estimates and percentages vary slightly between different 2011 National Household Survey products. When these data are summed or grouped, the total value may not match the sum of the individual values, since the total and subtotals are independently rounded.

20 *Inuit Nunangat* includes land, water, and ice, whereas the Greenlandic term *Inuit Nunaat* (sometimes used by Statistics Canada) describes land but does not refer to water or ice. The Inuit Tapiriit Kanatami notes that the former term is more inclusive and thus preferred. For this reason, it is used throughout the report.

Within a broader context, the most recent census data available from the 2011 NHS[21] indicate that as of 2011, 1,400,685 people in Canada identified themselves as Aboriginal, of whom 60.8% identified as First Nations, 32.3% as Métis, and 4.2% as Inuit (Statistics Canada, 2013b) (see Figure 4.1 for counts). As of 2011, Aboriginal people accounted for 4.3% of the total Canadian population, compared with 3.8% of the population enumerated in the 2006 Census, 3.3% in the 2001 Census, and 2.8% in the 1996 Census (Statistics Canada, 2013b).[22] As of 2006, there were proportionally more Aboriginal people in Canada (4%) than in Australia and the United States (both at 2%), but proportionally fewer than in New Zealand (15%) (Statistics Canada, 2008).



Data Source: Statistics Canada, 2013b, using 2011 NHS data

Figure 4.1

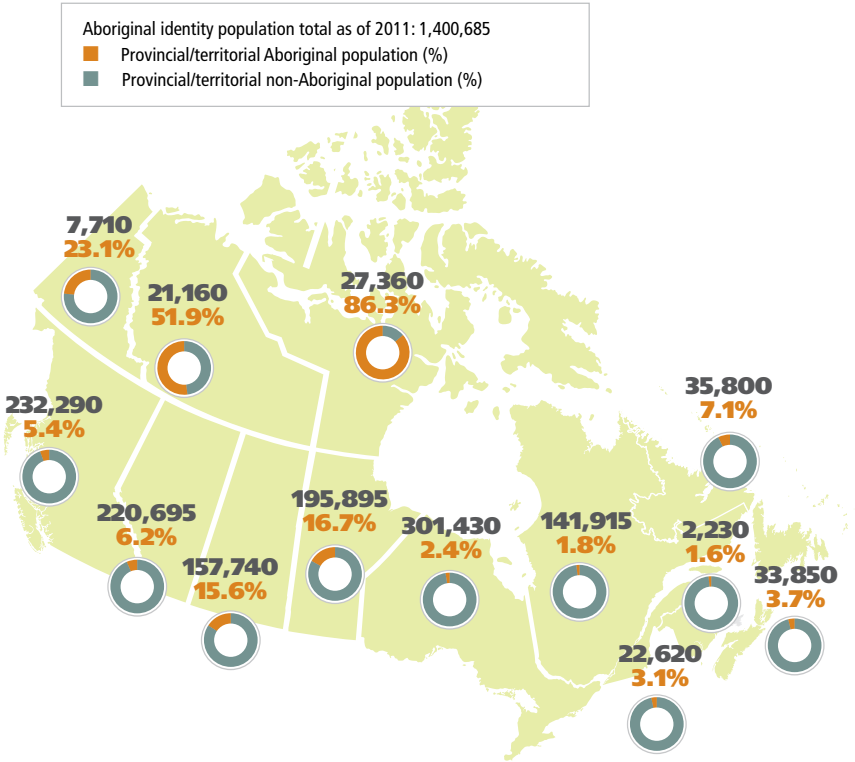
Population Counts by Aboriginal Identity, Canada, 2011

Please note that the population totals of Inuit, Métis, and First Nations do not add to 1,400,685 (the total Aboriginal identity population). Only single identity responses are shown in this figure. Less than 3% of respondents to the 2011 National Household Survey indicated that they had multiple Aboriginal identities or an Aboriginal identity that was not included elsewhere.

21 According to Statistics Canada, 36 out of 863 inhabited reserves were incompletely enumerated. As a result, they were not included in 2011 NHS results. Statistics Canada notes that the impact of missing data will be greatest on data for First Nations people and for persons registered under the *Indian Act* (Statistics Canada, 2013a).

22 Data sets from Statistics Canada on Aboriginal peoples presented in this report can be compared over time. However, slight differences in wording, methodology, and legislative changes that affected concepts such as Aboriginal identity and registered Indian status, changes made to the definition of *reserves*, and differences in the list of incompletely enumerated reserves, plus the voluntary nature of the survey, should be taken into account when comparing the data (Statistics Canada, 2013b).

As of 2011, the majority of people in Canada reporting their Aboriginal identity reside in Ontario (21.5% of the total Aboriginal population), 57.6% live in one of the four western provinces, and about 4.5% of all Aboriginal people live in the three northern territories (Statistics Canada, 2013b). While territorial residency represents a relatively small percentage of Canadian Aboriginal people overall, Aboriginal people form a significant proportion of the general population in the territories. For example, 86.3% of Nunavut's population identifies as Aboriginal, as does 51.9% of the population in the NWT and 23.1% in Yukon (Statistics Canada, 2013b) (see Figure 4.2).



Reproduced with permission from AANDC, 2013a
Data Source: NHS, 2011

Figure 4.2

Percentage of Aboriginal and non-Aboriginal People in the Population of Canada, 2011

The figure shows Aboriginal populations across Canada. Percentages listed represent the percentage of Aboriginal people in the province or territory, and the counts listed represent the total Aboriginal identity population in the province or territory.

Age is also an important demographic consideration. The Canadian Aboriginal population is relatively young and is quickly growing, with a median age of 28, compared with 41 for non-Aboriginal people. The Inuit population is the youngest among all Aboriginal people, with a median age of 23 (Statistics Canada, 2013b). Higher fertility rates and shorter life expectancy than the non-Aboriginal population are cited as the main reasons for this observation (Statistics Canada, 2011). Children and youth aged 24 and under comprise almost half (46.2%) of all Aboriginal people, compared with 29.5% of non-Aboriginal people (Statistics Canada, 2013b).

4.2 ABORIGINAL HEALTH AND WELLNESS

There are commonalities and differences in the ways Aboriginal peoples understand what health is and means. Holistic understandings of health generally comprise mental, physical, spiritual, emotional, and social dimensions. It is understood that the health and well-being of individuals and communities are interdependent and equally important (NAHO, 2007). As Vukic *et al.* (2011) suggest, the Aboriginal wellness model involves the physical, emotional, mental, and spiritual health of a person in connection to extended family, community, and the land. In this context, health does not stop at the individual or with physical health (as discussed in Chapter 3); it includes relational features of life in community (Birch *et al.*, 2009). The National Collaborating Centre for Aboriginal Health at the University of Northern British Columbia (2012) offers a definition that includes these important considerations:

> Indigenous health is visualized as the interconnected strands of a spider-web, in which issues such as poverty, a history of colonization, geographic location and connection to land, gender, food security, education and other factors, intersect in the lives of individuals, families, communities, nations and peoples. This more holistic approach to health is rooted in Indigenous ways of knowing and being, and represents a significant step beyond health conceived as a matter of illness due to biomedical cause and effect or lifestyle choices.

Although we can derive commonalities in the holistic and relational features of health and wellness, difference and diversity in these Aboriginal concepts are important to recognize as well. These reflect important historical, social, cultural, and political differences for Métis, First Nations, and Inuit (as described in Box 4.1 and the following paragraphs). For example, research from the former Métis Centre at NAHO noted that Métis have a broad holistic sense of health, where individual well-being incorporates the spiritual, mental, emotional, and physical dimensions of a person. Health for Métis is also directly connected to community and family structures, both socially and ecologically

(Chartrand, 2011). In the past, Métis used Western medicine to treat illness if it was affordable, but also relied on their maternal Indigenous heritage, including traditional teachings of medicine based on Indigenous knowledge (Chartrand, 2011). The implications, according to the Métis Centre, are that Métis share common conceptualizations of health with other Aboriginal people, but their history has resulted in different combinations of traditional and Western scientific health practices.

According to the First Nations Centre (FNC), which was housed at NAHO,[23] in First Nations cultures health is conceptualized holistically: it is a balance between the physical, mental, emotional, and spiritual realms of life (FNC, 2012). For some First Nations cultures, health is also based on living according to the seven grandfather teachings of wisdom, love, respect, bravery, honesty, humility, and truth (FNC, 2012). For many, the Medicine Wheel (encompassing mental, emotional, spiritual, and physical dimensions) is a symbol of healing and interconnectedness and provides a holistic foundation for peaceful interaction and personal growth (Lane *et al.,* 2002; Archibald *et al,*. 2012). The many versions of the Medicine Wheel illustrate the diversity of First Nations peoples and traditions. Understandings of this concept are based on different community conceptualizations imbued with diverse meanings stemming from specific cultural contexts, practices, and uses.

Finally, the Inuit Tapiriit Kanatami, the national Inuit organization that represents four Inuit regions in Canada, explains that the Inuit also have a holistic view of health, and believe that the overall health of Inuit can improve by addressing current socio-economic conditions (ITK, 2007). Contemporary scholars of Inuit health appear to focus largely on the impact of rapid cultural shifts in the North on the Inuit, their traditional practices, and their ways of life (Richmond, 2009; Kral *et al.*, 2011). For example, Richmond (2009) points out that the shift in their way of life, especially from traditional to market economies, has had considerable consequences for the social, cultural, economic, and physical health of the Inuit, although the pathways and processes connecting this transition to the social determinants of Inuit health have only been peripherally explored. The linking of declining participation in traditional activities and declining health and social well-being of the Inuit reflects how health has, and continues to be, rooted in relationships with the land and cultural, land-based practices; this is a theme that runs through most of the work that seeks to define health for all Aboriginal peoples.

23 The federal government, through Health Canada, cut all funding for NAHO in June 2012.

Box 4.1
"Being Alive Well": A Concept from the Whapmagoostui Cree

While one community's conceptualization of health cannot be generalized to all Aboriginal people in Canada, the Whapmagoostui Cree's conceptualization of *miyupimaatisiiun*, or "being alive well," offers a specific example and a more general definition of "holistic Aboriginal health." Adelson (1998) explains that *miyupimaatisiiun* integrates concepts of wellness, health, community, land, traditional knowledge and practice, and, notably, consumption of traditional Cree "bush" food. She argues that this distinctly Cree concept of health derives from a particular cultural and historical perspective, and, just as health is always defined and mediated within the constraints of social and cultural boundaries, so too is *miyupimaatisiiun* (Adelson, 1998).

Adelson points to the ways that "being alive well" is more than an aspect of differently defined health (differently defined in relation to the Western biomedical model). It is an aspect of "being Cree" related not only to geographic place and to the land, but intimately connected to the health of that land, the food consumed from it, and the rights of access to it. Holistic health is here defined as connection to the land that imbues a sense of identity and is also connected to the politics of autonomy. These theoretical framings offer a clearer understanding of health that significantly ties conceptualizations of health to identity, politics, geography, and history in ways that are arguably relevant to definitions, understandings, and actions surrounding Aboriginal health, intergenerational health and well-being, and community health.

Most of the literature documenting the health of Aboriginal people is primarily epidemiological. There is limited discussion of the social determinants of Aboriginal health that contribute to health status, or of the mechanisms and contexts through which social determinants influence wellness (Loppie Reading & Wien, 2009). Research from the National Collaborating Centre for Aboriginal Health by Loppie Reading and Wien (2009) represents one example of how inequalities in social determinants of health can behave as barriers to addressing health disparities in Aboriginal populations. The authors identified health behaviours, physical environments, employment and income, education, and food insecurity as determinants that have a direct impact on wellness. Health care systems, educational systems, community infrastructure, environmental stewardship, and cultural continuity were identified as the origins of many of these conditions; and socio-political and economic factors such as colonialism, racism, and self-determination were highlighted as determinants that have the

most "profound" influence on population health (Loppie Reading & Wien, 2009). The Panel agreed that more research in this area would represent an important step towards improving health and wellness outcomes among Aboriginal peoples.

4.3 THE PLACE: NORTHERN CANADA

> "People and plants are very alike. We both grow on the land."
>
> — Jimmy Memogana of Ulukhaktok, in Bandringa *et al.* (2010)

The extensive coastline, sea ice, and collection of islands, as well as the tundra, tree line, boreal forest, and the high concentration of lakes differentiate northern Canada from the rest of the country. It is a place rich with cultural, ecological, geographic, topographic, and climatic diversity. Consideration of the remoteness of northern Canadian communities is essential to understand many of the realities of life there. Across northern Canada there exists significant variation in physical landscapes, as well as in plant and animal life, customs, and livelihoods. From the interior Canadian Shield in northern Ontario to the coastal regions of Nunavik and Labrador, to the Selwyn and Rocky Mountain ranges of Yukon and the NWT, to the northeastern tip of icy Ellesmere Island, people have developed ways of life suited to their surroundings. Aboriginal peoples' relationships to land, or place, are necessary considerations when thinking of northern Canada, and have explicit connections to health, well-being, and food security.

For Aboriginal people in Canada, and Indigenous peoples globally, connection to land is central to cultural identity and way of life (UN, 2008), and foundational to health and well-being (Richmond & Ross, 2009). For many, the health of the land itself is tied closely to personal and community health and wellness (Parlee *et al.,* 2005). As a Cree Elder from Chissasibi asked, "If the land is not healthy, how can we be?" (Adelson, 2000). Members of the Lutsel K'e Dene First Nation (NWT) identified land as a cornerstone of Dene culture (Parlee *et al.*, 2007). Hunting, visiting spiritual sites, and simply being out on the land were expressed as having a "profound importance" to people's sense of well-being. As Maurice Lockhart, a Denesoline man, explained:

> When loneliness comes upon you, you've got to do something about it. Maybe take a walk out in the forest. When you get up on the top of a hill and you see all the beautiful scenery around you, like the trees, mountains, lakes and shores, it's so beautiful, it makes you wonder who did this all for you? This is how you forget about your loneliness (Parlee *et al.,* 2007).

Importantly, place determines what kinds of traditional/country food are available; what traditional practices exist to collect, trap, catch, and fish such food; and what traditional knowledge emerges from the environment. Although environmental systems are dynamic, changes are currently being experienced on the land at rates more rapid than those indicated by recent historical trends. These changes to the land are in turn affecting the traditional activities and cultures of Northerners. This has implications for their livelihoods, including the type and extent of opportunities to harvest local food.

4.4 LEGACY OF ENVIRONMENTAL DISPOSSESSION

The concept of environmental dispossession has particular relevance to the issue of food security, as it refers to the processes through which Aboriginal peoples' access to the resources of their traditional environments and communities is reduced by practices that the state sanctions, or at least tolerates. The Panel identified direct and indirect forms of environmental dispossession and the broader impacts of colonialism as negatively affecting the extent to which Aboriginal peoples can practice self-reliance. The Panel also noted the negative consequences of these factors on both the mental and physical health of the affected communities, consequences that extend to issues surrounding food security (Richmond & Ross, 2009).

Direct forms of environmental dispossession involve processes that physically disable use of land, such as industrial activities and the development of contamination events that may sever ties to traditional food or resources required for sustaining daily activities. The forced relocation of the Nutak and Hebron Inuit in the 1950s provides a good example of this form of dispossession, in which the community members were forced into new environments where they had limited ecological or traditional knowledge, and that also put pressure on the receiving community:

> The sudden presence of hundreds of new residents led to stresses upon local resources […] undermining the carrying capacities of those environments and affecting every aspect of community economy […]. Depopulating the coast north of Nain isolated Inuit from the richest bioregion in Labrador. Returning to their traditional hunting and fishing camps now required arduous and expensive travel (Evans, 2012).

Indirect forms of dispossession occur as a result of policies, regulation, or development whose intent is to sever Indigenous peoples' links to the land and to the Indigenous knowledge it fosters. Perhaps the best example of this type of dispossession is the result of the experience with Indian residential schools (Waldram *et al.*, 2006), which date back to the 1870s. The last of the

130 schools closed in 1996 (TRC, n.d.). Over 150,000 First Nations, Métis, and Inuit children were forcibly placed in government-funded, church-run schools designed to eliminate parental involvement in the intellectual, cultural, and spiritual development of these children. Deprived of traditional knowledge, the traditional skills and ability of successive generations to live off the land were diminished or completely lost. The loss of intergenerational knowledge and skills transfer has clear implications for food security. In addition, the residential schools' effects have been felt throughout the generations, contributing to ongoing and pervasive social problems (Waldram *et al.,* 2006).

In the contemporary context, the consequences of environmental dispossession have significantly impacted and strained the social and cultural fabric of many Aboriginal communities' identities (Richmond & Ross, 2009; Borrows, 2010), and have resulted in clear implications for local environmental knowledge and intergenerational knowledge transmission in Aboriginal communities today. This point is illustrated by Big-Canoe and Richmond (2013), who found that among Anishinabe youth, strong social relationships and access to land are perceived as equally critical to intergenerational knowledge transfer. Richmond and Ross (2009) argue that environmental dispossession is at the root of health and social inequities borne by Aboriginal communities in the modern context.

4.5 CULTURAL RELEVANCE OF TRADITIONAL KNOWLEDGE

As noted in Chapter 2, traditional knowledge is a valuable source of evidence informing this assessment. Traditional knowledge, however, represents much more than learned information. McGregor (2004) explains why a discussion of the cultural component of traditional knowledge is critical: "Aboriginal People define traditional knowledge (or traditional ecological knowledge, TEK) as […] a body of knowledge. It is expressed as a 'way of life'; it is conceived as being something that you do." Traditional knowledge as a living knowledge process includes knowledge from the distant and recent past, knowledge that is being acquired today, and knowledge that will be acquired in the future (ITK, 2012) — in other words, knowledge that has developed over millennia and is passed on from generation to generation. It is a systematic way of thinking applied to phenomena across biological, physical, cultural, and spiritual systems that are vitally important to maintaining culture, livelihoods, and well-being.

Traditional knowledge can be understood as an "integrated package" spanning systems of classifying plant and animal wildlife, traditional management systems and the social institutions that govern them, and world views (Berkes, 2008). The National Collaborating Centre for Aboriginal Health succinctly explains some of the significance of traditional knowledge for the Inuit. While acknowledging

that *Inuit Qaujimajatuqangit* ("that which Inuit have always known to be true") encompasses all knowledge (and is therefore not easily defined in one word), being grounded in traditional knowledge supports personal wellness and also contributes to a collective, cultural sense of health and wellness that has sustained Inuit over generations (Tagalik, 2010). Traditional knowledge can also be understood as a major contributor to food security in terms of traditional/country food, including knowledge about plant and animal wildlife species; when, where, and what to harvest; food storing methods; and the moral and social rules and social institutions that govern how food is prepared, shared, and consumed (see Box 4.2).

The importance of traditional knowledge was underlined by the Supreme Court's 1997 *Delgamuukw vs. the Crown* decision, which confirmed Aboriginal title to land in British Columbia. Furthermore, the decision confirmed that courts must be willing to use oral history, including traditional stories and songs of the Aboriginal people, as evidence to determine and establish title (S.C.C., 1997).

Box 4.2
Traditional Knowledge, the Land, and Intergenerational Knowledge Sharing

"Since time immemorial, we were put here to take care of the land. Our grandfathers did not abuse the land and it is our turn to pass our knowledge on to our younger generation. What our forefathers kept all this time is very precious. It's now in our hands. Our Creator has given us the responsibility for taking very good care of what we have. If we don't take care of it, we will lose our own culture one day."

— John Petagumskum in McDonald *et al.*, 1997

Berkes (2008) calls attention to the point that in northern Canada, Aboriginal peoples often refer to their "knowledge of the land" rather than to "ecological knowledge." However, "land" for northern Aboriginal peoples encompasses more than the physical landscape; it includes the living environment. Following Legat *et al.* (1995), Berkes notes that the Dogrib Dene (Athapascan) term *ndè* is usually translated as "land." But its meaning is closer to "ecosystem," except that *ndè* is based on the idea that everything in the environment has life and spirit (Legat *et al.*, 1995).

Traditional knowledge of the local environment, combined with the related skill sets for harvesting, travelling, and food processing, can be understood as a set of cultural practices necessary for food security. Even though many species are only available at certain times of the year in specific areas, northern Aboriginal peoples have developed the traditional knowledge, skills, and flexibility to harvest native plant and animal wildlife (Nuttall *et al.*, 2005). As noted in the *Arctic Climate Impact Assessment,* a strong body of research indicates that harvesting and its associated activities not only enable food and nutrition security, but "reaffirm fundamental values and attitudes towards animals and the environment and provide a moral foundation for continuity between generations" (Nuttall *et al.*, 2005). Using the example of seal hunting in northern Canada and Greenland, the authors draw attention to the complex yet specific local rules that guide the sharing and distribution of each harvest, as well as to the fact that nearly all parts of the seal are used for different purposes. They note that although an increasing percentage of the population is not directly involved in harvesting, research highlights its continued importance for the wider community and not just those directly involved.

As observed by Aboriginal organizations and researchers, the transmission of this knowledge across generations is vitally important for the health and wellness of individuals and communities. As defined in the Panel's conceptual framework (Figure 2.1), intergenerational well-being is both a *requirement* for food security, because the health and well-being of community members and individuals enables them to "pass along the values necessary to sustain [their] group across time" (Blackstock, 2008); and an *outcome* of food security, because health and well-being are promoted through access to nutritious traditional/country and market food. Intergenerational well-being promotes the health of the community, while at the same time strengthening cultural identities, connection to land, and collective purpose and belonging (Barnhardt, 2005; Tagalik, 2010).

In examples of intergenerational knowledge transmission, Nuttall *et al.* (2005) document how, at an early age, boys in seal hunting households in Canada and Greenland go on hunting trips with their fathers, where they begin to learn the skills and knowledge required to become successful hunters and providers. Ohmagari and Berkes (1997) report how traditional methods of education based on participant observation and apprenticeship in the bush have enabled the transmission of women's Indigenous knowledge in two Omushkego Cree "People of the Muskeg" communities in James Bay, Ontario — knowledge such as setting snares and nets, tanning animal hides, and smoking geese. Similar findings have been reported from Inuit areas (Pearce *et al.*, 2011). Interviews with young male hunters in Holman (NWT) revealed memories of travelling by

dogsled or snowmobile with their fathers (and sometimes mothers) on hunts (Condon *et al.*, 1995). Memories and historical knowledge of weather and climate changes (and the associated implications for wildlife) are revealed and passed on to younger generations via oral histories and contemporary observations (Nuttall *et al.*, 2005). Noongwook *et al.* (2007) describe how knowledge about bowhead whaling at one locale on St. Lawrence Island, Alaska was successfully sustained via oral tradition despite the fact that the site was not used for nearly a century. The strength of this knowledge is demonstrated through a successful resumption of whaling when needed. See Box 4.3 for a selection of quotes that highlight the importance of intergenerational knowledge transmission to food security and food sovereignty.

Box 4.3
On the Importance of Harvesting and Intergenerational Knowledge Transmission

"Why is hunting important to me? Tradition I guess. We need traditional food and the kids gotta learn how we grew up. They like to go out too. It's good for them and me to be out there. It's the best kind of R and R there is. It gets cold sometimes, but you gotta do it."

"I remember when I was younger, I used to travel with my Dad by dog sled. We used to spend a good deal of time in the spring down at Kaoraokut. My Dad used to have to cross cracks in the sea ice which he did by getting pieces of ice to use as a bridge. I really remember those days."

— Responses from two young Inuit men from the community of Holman, as documented in Condon *et al.*'s 1995 review of subsistence hunting.

In addition to enhancing scientific understanding of past climatic events, these stories also provide information about responses that have helped communities adapt to change (Nuttall *et al.*, 2005) (see Box 4.4 for more on this). However, Condon *et al.* (1995), Ohmagari and Berkes (1997), and Pearce *et al.* (2011) also emphasize that social, economic, political, and climate shifts have increasing, significant impacts on the intergenerational sharing of knowledge. While resilience in Aboriginal communities has been facilitated by adaptable practices demonstrated by past generations, younger generations appear to be more vulnerable due to their lack of experience in hunting and increased experience with southern education, cultures, and technologies

(Pearce *et al.*, 2006), as well as changing social circumstances that offer them less access to experienced hunters with the requisite traditional knowledge (Ford *et al.*, 2006). See Chapter 7 for further discussion of the effects of the transition from subsistence to wage economies across northern Canada, and the implications for harvesting and food security.

Box 4.4
Land, Culture, and Traditional Knowledge in a Changing Arctic

"We are an adaptable people. There is no doubt about that. We've had to be. That's how we have always travelled season to season looking in pursuit of animals. We've weathered this storm of modernization fairly well — going from dog teams to snowmobiles, and flying jumbo jets and going from igloo huts to permanent homes, and of course, going from our environment — which is our supermarket — to now having supermarket-like stores in communities — all within a few decades.

"This has not been without consequences. But through it all, we have always had our land. Our very predictable environment and climate and the wisdom of our hunters and our Elders that they have gained through the millennia — and that always helped us to adapt to the situation. Because the hunting culture is not well understood — it is not only about the killing of animals, or the pursuit of animals. In fact, the real process of the hunt is extremely powerful. Eating and hunting personifies what it means for us to be Inuit. These skills and traditions are passed down generation to generation."

— Sheila Watt-Cloutier, Former Chair of the Inuit Circumpolar Council, as quoted in White & Sheppard, 2011

The young, quickly growing, and geographically dispersed population of the Canadian North has many implications for the health, well-being, and food security of northern Aboriginal peoples. Ensuring that this growing population acquires access to resources, education, and skills training are important determinants to consider (Statistics Canada, 2008). The Panel has noted the coinciding cultural determinants of health that may be affected by these demographic and geographic shifts, including intergenerational transfer of traditional knowledge, language transmission, social roles, and cultural norms, along with the ways these cultural determinants may shape access to, and availability of, food.

In the Aboriginal context, language is described as "not only a means of communication, but a link which connects people with their past and grounds their social, emotional and spiritual vitality" (Norris, 1998). Although the issue of language is not a central factor in food security, it is part of the broader context in which sustainable solutions to food security will be grounded. According to the 2011 NHS, 17.2% of the Aboriginal identity population indicated that they were able to conduct a conversation in an Aboriginal language, including 63.7% of Inuit, 22.4% of First Nations people, and 2.5% of Métis (Statistics Canada, 2013d). This represents a 2% decline from 2006, despite an increase of 20.1% in the Aboriginal identity population (Statistics Canada, 2013d). The indirect consequences of urbanization and demographic change mean that opportunities for intergenerational knowledge exchange include opportunities to learn Aboriginal languages. For example, 2011 census results reveal that in census subdivisions with high proportions (70% or greater) of people reporting an Aboriginal mother tongue, most people (97%) with an Aboriginal mother tongue spoke that language at home. People were less likely (63%) to speak their Aboriginal mother tongue at home in census subdivisions with low proportions (under 30%) of people reporting an Aboriginal mother tongue (Statistics Canada, 2012a). Older generations report more knowledge of Aboriginal languages than do younger generations; in 2006, 18% of children aged 14 and younger had knowledge of one Aboriginal language, compared with 37% of those aged 75 and older (Statistics Canada, 2010a). These statistics reveal a worrisome trend that was emphasized at the 2013 Nunavut Food Security Symposium: an important connection between language and food security exists, and the role of intergenerational knowledge transmission in providing this connection cannot be understated (NFSS, 2013).

4.6 CONCLUSIONS

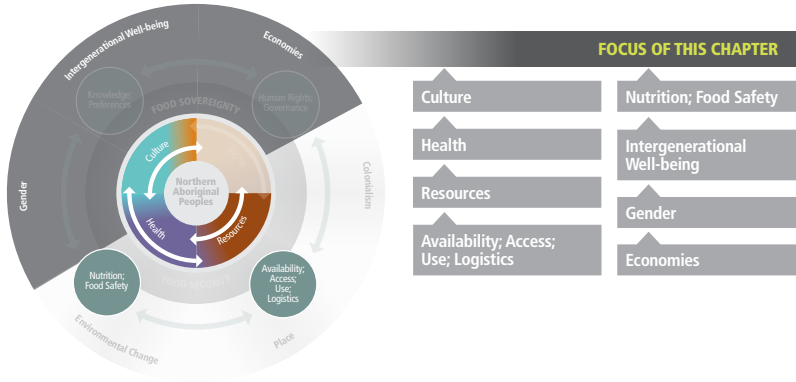
Northern Canada is geographically and culturally diverse, encompassing the three territories, Nunavik, Nunatsiavut, and parts of several provinces. Distinct populations of First Nations, Métis, and Inuit call northern Canada home. While each culture and community is unique, Aboriginal definitions of health and wellness include mental, physical, spiritual, emotional, and social dimensions, and are closely connected to the land, air, and water. Individual and community health are understood to be interdependent and equally important. As a result, this report takes a holistic view of health and wellness, and recognizes the importance of intergenerational well-being, cultural well-being, and traditional knowledge. While each of these have close links with food security and food sovereignty, these connections have been challenged by the legacy of colonialism and environmental dispossession, as well as by contemporary social, cultural, and environmental changes. Northerners continue to enact adaptive strategies in response to these difficult issues.

5

The Traditional Food System

- Food and Culture
- Harvesting Studies
- Dietary Recall Studies and Surveys
- Determinants of Food Safety and Quality
- Commoditization of Traditional/Country Food
- Conclusions

5 The Traditional Food System



Key Findings

Traditional/country food is an important enabler of food security and health in the Canadian North. Despite the presence of market food in the contemporary northern diet, traditional/country food is central to the identity and well-being of Aboriginal people.

Food sharing remains a central northern Aboriginal cultural practice and is critical to community well-being.

Harvesting and traditional/country food consumption are linked to food security. However, some longitudinal data indicate that participation in harvesting activities and the consumption of country food have been declining recently in Aboriginal communities.

Participation in harvesting activities varies widely across and within Aboriginal communities. Aboriginal land rights play a critical role in securing access to natural resources, such as access to some migratory species.

Rates of traditional/country food consumption vary across northern Canada by age, gender, level of education, community size, and region. Dietary recall studies can help assess food consumption patterns across various periods of time.

continued on next page

Traditional knowledge, the prevention of risk-agent growth, monitoring and surveillance, and education represent some of the primary methods for reducing risks associated with consumption of traditional/country food.

While many still believe that traditional/country food should be shared and not sold, as ways of life in northern Canada transform, so will food sharing practices and the norms that influence them.

This chapter focuses on the traditional/country food system, one of the two major food systems used by northern Aboriginal peoples. The other system, the market food system, is discussed in Chapter 6. Using harvesting statistics and dietary recall studies, the chapter presents an overview of the prevalence of traditional/country food consumption in northern Canada and explores the role of this critical food system across communities, regions, and populations. It closes with a discussion of the commoditization of traditional/country food as an emerging trend.

The term *traditional food system* is defined by Kuhnlein and Receveur (1996) as "all food within a particular culture available from local natural resources and culturally accepted. It also includes the sociocultural meanings, acquisition, processing techniques, use, composition, and nutritional consequences for the people using the food." *Traditional food* is the preferred term for First Nations and Métis, and *country food* is the preferred term for Inuit. This report uses *traditional/country food* as inclusive of all Aboriginal cultures in Canada.

Traditional/country food is an important enabler of food security and health in the North. In addition to what is known about its spiritual and nutritional value, other research demonstrates the connection between traditional/country food and food availability and access. Ford and Berrang-Ford (2009), for example, found that in Igloolik, NU, people whose diet included 50% or more of country food reported no instances of going a day without eating during the preceding year. On the other hand, of those respondents whose diet included 49% or less of traditional sources, 46% reported going an entire day without eating.

5.1 FOOD AND CULTURE

For Aboriginal people, the harvesting, processing, and consumption of traditional/country food provide many nutritional benefits and are deeply connected with community ethics and identity (Kuhnlein *et al.*, 2006) (see Box 5.1). The traditional food system is a cultural strength, integral not only to the cultural but to the social and economic lives of individuals and communities

(Berkes *et al.,* 2005). As Hansen *et al.* (2008) explain, food provides an opportunity to express and develop relationships among people. For example, Kral *et al.* (2011) found spending time with family harvesting, preparing and sharing food, and experiences on the land are a key part of Aboriginal well-being. As well, social and cultural factors associated with food security are important determinants of health (Kuhnlein *et al.*, 2001, 2006).

Box 5.1
The Cultural Importance of Traditional/Country Food

"The most important thing is that the land is changing and our people are changing at the same time, because of the relationship we have with the land we have lived on for thousands of years. Once that relationship changes, it means that we are not distinct anymore, we are not Dene anymore and that's the most important thing and the very biggest challenge we are dealing with; once we stop hunting and doing those traditional things, we are not Dene."

— Deh Gah Got'ie, Dene First Nation community member on the links between food security, environmental change, and the socio-cultural importance of traditional food (Guyot *et al.*, 2006)

5.1.1 Food Sharing

For generations, Aboriginal cultures and communities have used traditional practices, including food sharing, to promote food security and health. Although food sharing practices differ across social networks (Collings, 2011) and regions (Magdanz *et al.,* 2002), these practices can enable food security among northern Aboriginal populations (Kishigami, 2000; Gombay, 2009; Myers *et al.*, 2005). Food sharing practices and networks are a pragmatic component of existence in the North. Before they entered a more sedentary lifestyle in communities, as opposed to living on the land, northern Aboriginal peoples had to adapt to the temporal and spatial variations in resource availability (for instance, the annual migration of caribou or waterfowl). Under these conditions, food sharing helped to minimize the impacts of misfortune affecting an individual or a single household and reduced the consequences of environmental and economic strain (Nelson *et al.*, 2008). In analyzing food security outcomes in 14 Aboriginal communities, Thompson *et al.* (2012) found that traditional food sharing programs were more important to community food security than any other variable.

Today, Aboriginal people must still adapt to fluctuations in wildlife populations and migration routes and timing, and to a variety of new influences. These include population change, industrial development, need for income, and wildlife regulations. Despite these changes, sharing food has remained a way to maximize all aspects of well-being in a community. Exchanging food and equipment creates social bonds and unity between families, communities, and regions (Wheelersburg, 2008). It is a central aspect of northern Aboriginal culture and identity (Collings *et al.*, 1998; Searles, 2002) and a moral imperative rooted in ideas about community and gifts from the land (Gombay, 2010). In this way, reciprocity facilitates the distribution of food for economic purposes and strengthens personal relationships and social networks (Gombay, 2010).

Gombay (2010) notes that although sharing patterns vary across the Arctic, priority tends to be given to Elders and family members, with subsequent invitations extended to the wider community, the intent being that "ideally, nobody who asks should be denied food." Among vulnerable populations such as Elders, women (without a hunter in the household), and the young, food sharing ensures some measure of security (see Box 5.2).

Box 5.2
On Food Sharing

"I'm glad my hunter got a machine [snowmobile] from HTO [Hunter and Trapper Organization]. He went out hunting last week. He shared with people who have no machines, or single mothers. He mostly goes to people who can't get any."

— Woman in Nunavut on the role of food sharing (Chan *et al.*, 2006)

There is good evidence to suggest that food sharing is an important practice today. According to IPY Inuit Health Survey results, the majority (72%) of Inuit surveyed across Nunavut, the ISR, and Nunatsiavut reported that they received country food from a family member, while only 10% purchased their country food from stores (Egeland, 2010a, 2010b, 2010c). The IPY Inuit Health Survey also reveals that in 2007–2008 about 66% (ISR) to 80% (Nunatsiavut) of households shared country food with others in their communities (Egeland, 2010a, 2020b, 2010c). Results from the Aboriginal Peoples Survey indicate that, as of 2001, 96% of Inuit households shared harvested food with others (Tait, 2001). Findings from the IPY Inuit Child Health Survey show that 82% of households with preschoolers aged three to five shared their country food

with others in the community (Egeland, 2009). Across 16 communities and First Nations of the Dene Nation, 63% of respondents often experienced food sharing, and an additional 34% sometimes did (Dene Nation, 2012). Data from the 2008–2010 Regional Health Survey of on-reserve and northern First Nations communities indicate that 30% of children had someone who often shared traditional food with their household (in the 12 months prior to the survey), whereas others reported that this happened sometimes (55.1%) or never (14.9%) (FNIGC, 2011).

Major social changes are occurring alongside the transition to the wage economy, such as the commoditization of goods and services (including traditional/country food) that were previously shared, to alleviate the costs of hunting (Beaumier & Ford, 2010). This has had the effect of muddying the distinction between market and traditional/country food and their roles in food security, and is one mechanism that is shifting the economy towards wage-earning (Gombay, 2005). For some, this improves access to traditional/country food, but others are concerned that replacing important sharing networks with cash transactions could adversely affect food sharing networks and limit traditional/country food access to only those who can afford to pay for it (Beaumier & Ford, 2010). As explained in Chapter 8, climate change and concerns about the health and availability of traditionally and commercially harvested native wildlife species may have effects on peoples' ability and willingness to share scarce resources (see Statham & Ford, 2012).

According to Richmond (2007), sharing is associated with thriving health, which is defined "as one's ability to flourish in response to adversity," in addition to general well-being. But her narrative analysis of qualitative interviews with 26 Aboriginal Community Health Representatives from across Canada found that the need for income was so great in some communities that core beliefs about sharing and reciprocity were no longer regarded as important. The poor economic circumstances of some communities are causing a significant shift in the nature and meaning of help, away from practices based on reciprocity and mutual benefit, and towards income-based practices that benefit individuals (Richmond, 2007). Similarly, in their longitudinal study comparing the sharing networks of Inuit from the community of Holman, NWT, Collings *et al.* (1998) found that obligatory, non-kinship-based seal-sharing partnerships (the sharing form most frequently cited in ethnographic studies) have become much more informal and less frequent, although voluntary sharing among close relatives remains an important aspect of the contemporary Holman Island economy and identity.

Some Northerners appear to be more vulnerable than others to the effects of changing food sharing networks. Because women hunt less often than men, for example, women may be more dependent on sources of traditional food from outside the household. This is a particular problem for single women living alone, as well as for single mothers (Ford & Berrang-Ford, 2009). This finding is strengthened by research from Beaumier and Ford (2010), who found that it was often women who were most affected by declines in traditional sharing practices (recall the extended discussion in Chapter 3 on how rates of food insecurity vary according to social indicators). Reflecting on the evidence, the Panel noted that an abundance of traditional/country food in a community will generally lead to food sharing and food security (see Islam & Berkes, 2012). Conversely, a food insecure community will likely experience shortages of traditional/country food and/or a breakdown in community sharing mechanisms. Box 5.3 explains the role of community freezers as a food sharing mechanism.

Box 5.3
Community Freezers, Food Sharing, and Adaptation

In the 1980s, a government program in the ISR was introduced to fund community freezers and meat-cutting plants in participating communities. Similar programs have been undertaken in other northern regions. However, community freezers only work if there is country food available from hunters willing to fill them, either through donation, support payments to hunters for collection, cost sharing for hunting expenses, or direct sale. The government program also supported the establishment of commercial meat-cutting operations in the NWT. This commercialization of country food met with a mixed response from the community and, as a result, has had mixed success.

For instance, while Douglas and Chan (2012) concluded that community freezers have no real effect on physical food security in the ISR (because individual freezers can, and do, replace them), they found that freezers may fulfil the important cultural purpose of formalizing and normalizing food sharing and promoting traditional food use. Similarly, Boult (2004) noted that community freezers in Nunavut and Nunavik fulfil a "critical role" in providing storage facilities for community hunts, especially as more traditional, underground food storage facilities face issues with melting permafrost (see photos below). Community freezers can be considered as one culturally appropriate adaptation mechanism in response to the increased physical and economic challenges of accessing country food species and in response to changing lifestyles (Furgal *et al.*, 2012).

continued on next page

The Nunavik model under the Hunter Support Program of the *James Bay and Northern Quebec Agreement* (JBNQA), a model in existence across the Arctic, may provide some lessons learned for the development of such programs (Furgal *et al.*, 2012). In collaboration with Nunavut communities and researchers, and Nunavut's Department of Culture, Language, Elders, and Youth, architects White and Sheppard (2011) have been developing a regional network of Arctic farms, freezers, and camp hubs in Nunavut's Foxe Basin. Prototypes are in development for construction and testing in three sites along the proposed regional network, each of which offers a specific ecological or diet-related opportunity. A review of the conditions required for successful community freezer operations and their impacts on household food security is warranted prior to further re-investment and interest (Furgal *et al.*, 2012).

Images of an underground food storage facility in Tuktoyaktuk, NWT. These types of facilities are at risk as a result of melting permafrost.

Courtesy of Kue Young, 2008

5.2 HARVESTING STUDIES

For northern Aboriginal peoples in Canada, issues surrounding the right to food extend far beyond economic, nutritional, and physical accessibility. The hunting, harvesting, and sharing of traditional/country food is integral to reinforcing social cohesion and cultural continuity for northern Aboriginal communities. Despite the presence of market food in the contemporary northern diet, traditional/country food is central to the identity and well-being of Inuit and other Aboriginal peoples (ITK & ICC, 2012). Power (2008) suggests the concept of cultural food security as another domain of Aboriginal food security, distinct from individual, household, and community food security because food obtained from traditional food systems underpins cultural identity, health, and survival.

Harvesting statistics and dietary recall studies (see Section 5.3) are two of the main methods used to determine levels of traditional/country food access and consumption. Across the North, wildlife harvesting takes place within a socio-ecological context broadly defined by biophysical conditions, demographic change, cultural preferences, political and market-related factors, mandates of government agencies, and the involvement of various external actors and interest groups (e.g., animal rights organizations). These contextual factors, as well as internal household dynamics, influence how households use wildlife resources (Natcher, 2009).

As defined in the *Nunavut Land Claims Agreement* (1993), *harvest* means "the reduction of wildlife into possession, and includes hunting, trapping, fishing […] netting, egging, picking, collecting, gathering, spearing, killing, capturing or taking by any means." Harvesting data can shed light on the rates at which people are participating in all activities captured under the definition. Researchers have used a variety of social science methods to gather information from harvesters to establish counts for traditional food harvests in various Aboriginal populations in Canada (Berkes, 1990; Hopper & Power, 1991; Berkes, *et al.* 1994). Most of this research likely estimates the harvest of traditional/country food successfully. Some, however, is more accurate for larger animals than for smaller animals, including fish and waterfowl; this may be due to the quantity, duration, and routine fashion in which these resources are harvested.

Aboriginal harvesters have been found to be quite reliable for recalling the quantities of resources harvested and consumed over time (Krech, 1978). For example, Dosman and colleagues (2002) found that, among Cree hunters in northern Saskatchewan, detailed harvesting information could generally be recalled as far back as five years; for many individuals, this period was even longer. This recall ability has also been found to apply to other species, such as migratory bird eggs (Natcher *et al.*, 2012a). These estimates have been useful for research, policy, and resource management planning (Usher & Wenzel, 1987).

The roots of contemporary harvesting studies go back to the 1971 settlement of the *Alaska Native Claims Settlement Act* and the subsequent signing of the 1980 *Alaska National Interest Lands Conservation Act* (Fall, 1990). Since then, the Division of Subsistence has conducted subsistence research on the "who, what, when, where, how, and how much" of wildlife harvesting (Fall, 1990). This information is now used to support the Alaska Board of Fisheries and Board of Game in developing subsistence regulations consistent with sustained yield management policies. The Panel noted that the approach adopted by the Alaska Department of Fish and Game has, in many ways, informed the approach adopted throughout northern Canada.

Key land use and harvesting studies conducted in Canada are found in Table 5.1. Table 5.2 provides selected results from the *Gwich'in Harvest Study*, 1995–2001 (GRRB, 2009).

Table 5.1

Examples of Land Use and Harvesting Studies Conducted in Canada, 1975 to Present

Study	Description	Date
Research to Establish Present Levels of Native Harvesting	This seven-year study was initiated by the Northern Quebec Inuit Association in 1975 to determine the extent of Inuit harvesting (JBNQNHRC, 1988).	1975
The Inuit Land Use and Occupancy Project (ILUOP)	This study was done in the NWT and northeast Yukon to document all subsistence in an area in excess of 2.8 million square kilometres (Freeman, 1976).	1976
Our Footprints Are Everywhere	This study was done to determine land use and occupancy; it was used to negotiate the Nunatsiavut Land Claim in Labrador.	1977
The Inuvialuit Harvest Study	This study was conducted from 1988 to 1997 to obtain a continuous, long-term record of Inuvialuit harvest levels for each of the six regional communities (Joint Secretariat, 2003).	1988–1997
The Gwich'in Harvest Study (GHS)	This study was a requirement of the *Gwich'in Comprehensive Land Claim Agreement*. The objective was to record the number of animals, fish, and birds harvested by Gwich'in within the Settlement Area (GRRB, 2009).	1992
The Nunavut Wildlife Harvest Study (NWHS)	This study was mandated by the *Nunavut Land Claims Agreement* to determine current harvesting levels and patterns of Inuit use of wildlife resources.	June 1996 and May 2001
The Sahtu Settlement Harvest Study	This study is required under the *Sahtu Land Claim Agreement* (1993). It recorded the total number of fish and wildlife harvested by Sahtu Dene and Métis.	1998 and 2003
Inuit Domestic Harvest Limits (IDHLs)	Since the settlement of the *Labrador Inuit Land Claims Agreement* (2005), the Nunatsiavut government has implemented a community harvest study program for 138 different species and resources used by Inuit residing within the Nunatsiavut Settlement Region.	Ongoing

This table shows a collection of land use and harvesting studies in Canada to illustrate when, how, and where different types of studies were commissioned.

Table 5.2

Harvest Study Results from the Gwich'in Settlement Area, 1995–2001

Species	Number Harvested in Year 1	Number Harvested in Year 6	Six-year Harvesting Average	Annual Number of Hunters Harvesting Each Species in Year 1	Annual Number of Hunters Harvesting Each Species in Year 6
Porcupine Caribou	1,906	2,054	1,558	135	87
Whitefish	24,937	30,551	26,533	74	75
Muskrat	1,590	14	2,660	19	3
Snowshoe Hare	752	315	864	22	14
Black Duck	560	815	717	27	30

Data Source: GRRB, 2009

Data were collected and combined from hunters in the communities of Aklavik, Fort McPherson, Inuvik, and Tsiigehtchic. The table illustrates the number of wildlife harvested in Year 1 and Year 6 of the study, as well as the annual number of hunters who harvested each species during the same years. This table includes one example of the most commonly harvested wildlife species from each of the categories established by the Gwich'in Renewable Resources Board: big game, fish, fur bearers, small game, and waterfowl. The examples presented here were chosen because they represent the species that were, on average, harvested the most frequently over the six-year period. As determined in the 1992 *Gwich'in Comprehensive Land Claim Agreement*, the Gwich'in Harvest Study was conducted in the Gwich'in Settlement area from 1995 to 2004.

Much of the information from these aforementioned studies is dated, and consistent data are not available to examine trends over time. These harvest study data are pooled data collected in support of the land claim negotiations and, as such, were not meant to be temporal monitoring data. The Nunavut Wildlife Harvest Study (Priest & Usher, 2004), the Gwich'in Harvest Study (GRRB, 2009), NWT Resident Hunter Harvest Surveys (Carrière, 2012), and community conservation plans from across the ISR (WMAC, 2009a, 2009b, 2009c) represent some of the more recent, comprehensive harvest studies conducted in accordance with land claims agreements. Some data are lately available from the Labrador area, the site of more recent land claims agreements. Harvesting rates are also documented in academic literature from Canada (see Berkes, 1979, 1990; Gamble, 1988; Berkes *et al.*, 1994; Bromley, 1996; Byers & Dickson, 2001; Usher, 2002), and from other circumpolar regions such as Alaska (see Andrews, 1989; Magdanz *et al.*, 2002, 2010; Wolfe, 2004; Ashjiam *et al.*, 2010; Braem, 2011; Suydam *et al.*, 2011).

More recent data — from 216 First Nations communities participating in the 2008–2010 Regional Health Survey — show that in the year before the survey, 32.2% of First Nations adult respondents went fishing, 28.3% gathered berries or other food, and 22.1% went hunting or trapping (FNIGC, 2011). Significantly more men than women reported fishing and hunting or trapping, and significantly more women than men went food gathering (FNIGC, 2011). Aboriginal Peoples Survey (2001) results indicate that about 71% of Inuit adults across the Canadian Arctic were involved in the harvesting of country food, with most harvesting occurring in Nunavik (81%), followed by Labrador (76%), Nunavut (70%), and the ISR (55%) (Tait, 2001).

Similarly, the Survey of Living Conditions in the Arctic investigated the percentage of Indigenous adults participating in harvesting-related activities over a one-year period in Canada, Greenland, Chukotka (Russia), and northern Alaska. Of the nearly 4,000 Canadian Inuit respondents, 69% reported fishing activities, 73% prepared or packed for excursions on the land or water, 59% hunted waterfowl, and 11% engaged in trapping (Poppel *et al.*, 2007). The study found that the differences in harvesting activities between countries were statistically significant but not large, suggesting that most Inuit participate in a variety of harvesting-related activities.

Other research has pointed out the significant gender gap in harvesting activities. For example, Tait (2001) found that out of all age groups surveyed, young Inuit women (aged 15 to 24) participated in harvesting at the lowest rates (55%). In comparison, 74% of men in the same age group reported harvesting activities during the year prior to the survey.

The reporting of wildlife harvests is necessary for the effective monitoring and management of wildlife and for calculating minimum needs levels (GRRB, 2009; Giroux *et al.*, 2012). In some cases, however, jurisdictional issues can complicate reporting schemes, which may in turn contribute to the lack of harvesting data on some species. For example, harvest monitoring for the Porcupine Caribou Herd falls under the jurisdiction of two countries as well as three regional and several Aboriginal governments (Gunn *et al.*, 2011). Further, using harvest studies to establish minimal needs levels may prove disadvantageous to harvesters. Due to the lack of longitudinal data, minimal needs levels are most often based on harvest "snapshots" that may fail to reflect the complexity and variability of Indigenous resource use over time. If one is interested only in the number of a certain species harvested during a defined period of time, harvest surveys may be sufficient; however, surveys alone do not uncover how

people's livelihood choices are embedded in culture and history, as well as in their economic and political settings (Cundill *et al.*, 2011). This may be one of the more significant limitations of harvest studies, which have often failed to fully acknowledge the structural barriers and opportunities that influence wildlife harvesting (Natcher *et al.*, 2012a), the options available to community harvesters or the obstacles they face (Nelson *et al.*, 2005), or the formal and informal institutions that influence resource use (Wenzel, 2005).

There is an extensive history of harvest studies conducted with Aboriginal communities in Canada that also involves calculation of the amounts of potentially edible food obtained from the harvests. Minimal effort, however, has been directed to find out how much of the harvested food people actually consume. The harvest studies noted above clearly did not have local needs and food security in mind. No provisions were made to supplement these studies with nutritional studies so that food security could be approached directly. Although harvest values can be converted to nutritional equivalents (Berkes & Farkas, 1978), there is no way to determine how much of the harvested potential human food was used for other purposes (for example, fed to dogs or used as trap bait).

A considerable literature exists that underscores the importance of wildlife harvesting in achieving food security and well-being in northern Aboriginal communities (Duhaime & Bernard, 2008; Gombay, 2010) (see Box 5.4). This same body of research also acknowledges the critical role of Aboriginal land rights in securing access to natural resources, such as access to some migratory species (Usher, 1983; Scott & Feit, 1992; Usher *et al.*, 1992); however, these studies are difficult to compare due to a high degree of theoretical and methodological variety, and substantial variability in reporting. Further, by failing to uncover the complexity and the context in which wildlife harvesting is situated, efforts to understand the relationship between wildlife harvesting and food security remain speculative. Although the research that quantifies the contribution of environmental resources in the livelihoods of Aboriginal communities is slowly increasing, it has yet to be widely acknowledged in policy circles. In addition, the general shortage of representative studies, coupled with the diversity in the quality and methods used, leaves key questions unanswered — yet answers to these questions are essential in the design of more effective policies for the future.

Box 5.4
Nunavut Harvester Support Program and Similar Programs

The Nunavut Harvester Support Program is available to registered Inuit beneficiaries; it includes the Capital Equipment Program, designed to provide financial assistance to harvesters in the form of snowmobiles, boats, and all-terrain vehicles (NTI, n.d.). There are no formal requirements for how those who receive equipment distribute the food they harvest (Glacken, 2008a). Communities can also carry out community hunts through another component of the program. Country food harvested during the hunt is distributed throughout the community at the discretion of local Hunters and Trappers Organizations, or HTOs (Glacken, 2008a). Other supplies such as camp stoves, sleeping bags, sewing machines, and fishing nets can be purchased at subsidized rates through the Small Equipment Program (NTI, n.d.).

Similar programs exist in the NWT, such as the Community Harvester Assistance Program and the Inuvialuit Harvesters Assistance Program. Nunavik has two similar initiatives: the Inuit Hunting, Fishing and Trapping Support Program, and *Eeyou Istchee*, the Cree Hunters and Trappers Support Program. *Eeyou Istchee* is unique in that it provides a basic income to Cree families who spend a significant portion of their time on the land. Both programs were implemented as per the JBNQA (Aarluk Consulting, n.d.).*

* Please see Aarluk Consulting's *Review of Harvester Support Programs* (n.d.) for more information about each of these initiatives.

5.3 DIETARY RECALL STUDIES AND SURVEYS

In addition to harvesting studies, the dietary recall study is an important method of measuring food consumption. Dietary surveys using a variety of methods, including food frequency questionnaires, can assess food consumption patterns across various time periods among respondents. Guyot's (2006) thesis review of published studies found that none had compared the amount of food harvested with the amount based on dietary surveys. To predict intake of traditional food, two data sets comparing harvest data and food consumption are needed. Research conducted by Guyot (2006) also suggests that climate change is affecting the harvest of traditional food by community members, and that some communities are changing traditional harvest practices to adapt to these changes.

Rates of traditional/country food consumption vary according to many factors, including age, gender, level of education, community size, and region. Using dietary recall surveys, Wein *et al.* (1990) found that Métis and First Nations households near Wood Buffalo National Park in northern Alberta consumed traditional/country food an average of 319 times per year, and that meat and fish from the local environment were a particularly significant part of the food supply. Morrison *et al.* (1995) concluded that the daily portions of traditional food use were high among Sahtu Dene/Métis adult participants in two communities in the northwestern portion of the NWT, with significant seasonal variation.

A dietary survey conducted with 122 Yukon First Nations adults reported that 17% of total daily energy was provided by traditional food, suggesting it is an important energy source in Aboriginal diets (Wein, 1995; Wein & Freeman, 1995). Moose, salmon, berries, and caribou are frequently consumed. Smaller remote communities consumed greater amounts of traditional food than larger communities. The study found that the frequency of traditional food consumption is influenced by a variety of factors, including cost of food at local stores and availability of traditional food for harvest in the area (Guyot, 2006).

Similarly, results from 24-hour recall surveys and food frequency questionnaires across 18 First Nations and Métis communities in Denendeh (NWT) and Yukon indicate that traditional food use in these regions is still common (Batal *et al.*, 2004). Traditional food items, which were used an average of 400 times per year in each household, were deemed "extremely important" in the diets of First Nations people living in Yukon (Wein & Freeman, 1995). A study by Schuster *et al.* (2011) compared new data with Wein and Freeman's 1995 results. Schuster and colleagues found that the importance of traditional food in the diet of Yukon First Nations had not changed in the past 15 years, but there was a difference in the frequency of consumption of some types of food, which was attributed to environmental variability. Respondents also noted that the limited availability of food species, harvesting equipment, and time to engage in harvesting activities represent challenges to their household food security.

Relatively few data are available for First Nations people living in the sub-Arctic regions of Manitoba, Ontario, and Quebec. Ongoing research, such as the First Nations Food, Nutrition and Environment Study (FNFNES), aims to increase knowledge about food and water security, food use, nutrient values of traditional food, and environmental chemical hazards in 100 First Nations communities across Canada. In 2010 the FNFNES was conducted in nine communities in

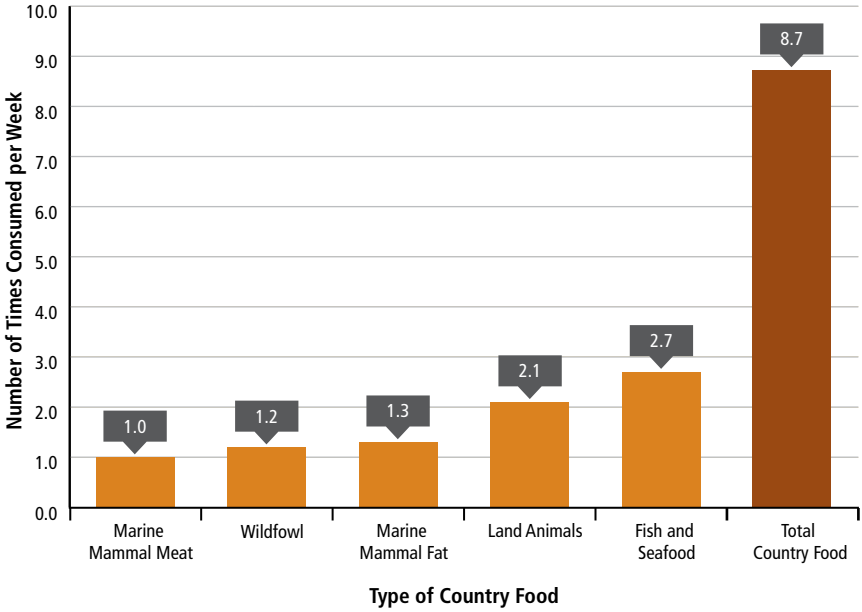
Manitoba, including two communities in the taiga shield/sub-Arctic ecozone. Caribou were identified as the most important traditional food (consumed by 100% of participants and consumed 113 days on average per year) in the ecozone. In terms of traditional food harvest practices, about the same percentage of participants (20%) from all ecozones in Manitoba hunted or set snares for food, but more participants in the taiga shield/sub-Arctic ecozone than in the other ecozones reported that they fished (45%) and collected wild plants (28%) (Chan *et al.*, 2012).

Surveying Inuit communities, Tait (2001) found that the rates at which country food is consumed vary across northern Canada, but, in general, country food accounts for at least half of the meat and fish consumed in 71% of Inuit households. Figure 5.1 shows Nunavik Inuit Health Survey (2004) results. Country food was consumed more than once per day. Land animals and fish and seafood were consumed more than twice per week.

As these and other data demonstrate, there is no single experience of northern Aboriginal food security. Demographic and socio-economic factors such as age, gender, and education are closely linked with access to enough culturally appropriate food. This represents an important consideration for programs and policies seeking to address food insecurity in the Canadian North.

For example, in Nunavik, the 2004 Inuit Health Survey data demonstrate that country food was consumed about nine times per week (see Figure 5.1), but the consumption frequency varied with socio-demographic characteristics such as age (consumption frequency usually increased with increasing age); gender (consumption rates were generally similar, but the type of food consumed varied); education (lower educational attainment was related to higher consumption of marine animals and berries); region (which affects availability of types of country food); community size (higher consumption of marine animals occurs in smaller communities while higher consumption of land animals and berries occurs in larger communities); and, finally, season (see Figure 5.2) (Blanchet & Rochette, 2008). The IPY Inuit Health Survey (2007–2008) and Nunavik Inuit Health Survey results both indicate that women tend to consume less country food than men (Blanchet & Rochette, 2008; Egeland, 2010a, 2010b, 2010c; see also Kuhnlein *et al.*'s 1995b review of the dietary intake of Baffin Inuit and Sahtú Dene/Métis), and eat different types of country food than men (Blanchet & Rochette, 2008).

There is also variation among youth. Findings from the 2006 Aboriginal Peoples Survey indicate that 18% of Métis children and youth between the ages of 6 and 14 consumed wild meat during the previous week (Statistics Canada, 2006a; Chartrand, 2011). Regional Health Survey[24] results show that 44.2% of on-reserve and northern



Reproduced with permission from Blanchet & Rochette, 2008
Data Source: Nunavik Inuit Health Survey, 2004

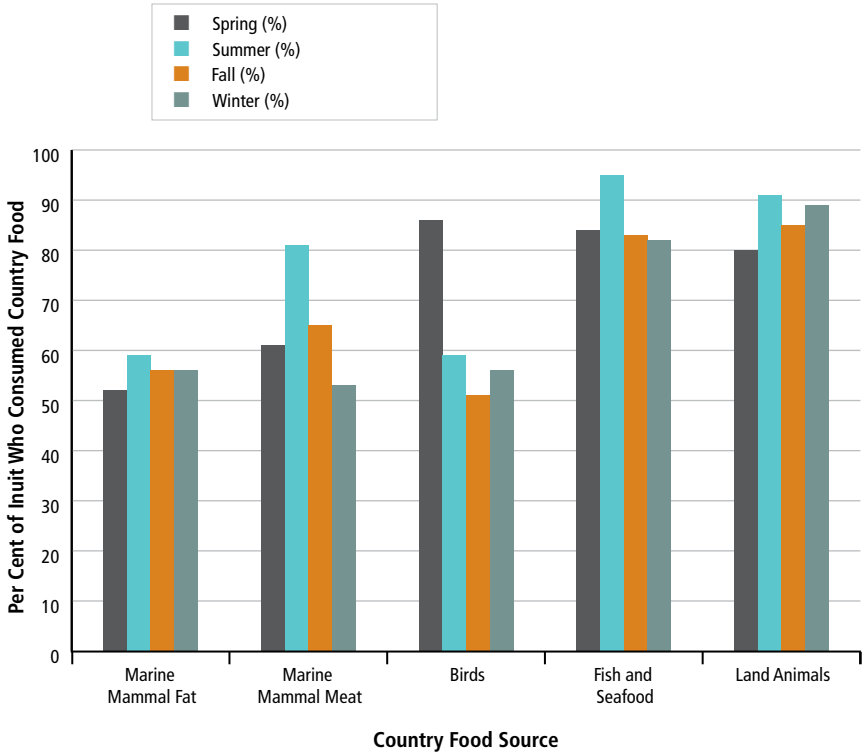
Figure 5.1

Consumption Frequency of Country Food Groups on a Weekly Basis Among Inuit of Nunavik, 2004

This figure depicts the average consumption frequency of country food groups per week. The following presents a more detailed description of the food categories and annual intake. *Marine mammal meat* refers to seal (accounting for 59% of total marine mammal meat consumption per year), beluga (35%), and walrus (7%). *Wildfowl* refers to geese (accounting for 64% of total wildfowl consumption per year), ptarmigans (32%), eggs (1.5%), and other birds (2.5%). *Marine mammal fat* includes beluga (accounting for 72% of total marine mammal fat consumption per year) and seal (28%). *Land animals* include caribou (accounting for 99% of total land animal consumption per year), bear (0.8%), and hare and fox (0.2% combined). *Fish and seafood* includes Arctic char (accounting for 59% of total fish and seafood consumption per year), whitefish (13%), trout/salmon (10%), mussels/clams (8%), dried fish (5%), other fish (4%), and scallops and seaweed (1% combined). Although this figure depicts the most up-to-date data from a survey of this scale, consumption rates may have changed during the past 10 years.

24 The Regional Health Survey is a national health survey that is fully directed and controlled by First Nations. It is longitudinal and gathers information about health, wellness, health determinants, and the concerns and issues of First Nations communities across Canada.

First Nations children from birth to the age of 11 in small communities (fewer than 300 residents) often[25] ate at least one protein-rich traditional food in the previous year, compared with 28.1% of children in medium-sized communities (300–1,500 residents) or 19.8% in large ones (more than 1,500 residents) (FNIGC, 2011). Inuit children are eating country food as well, although only 8.4% of caloric intake among Nunavut's children came from country food in 2007–2008 (see Figure 5.3). However, IPY Inuit Child Health Survey results compiled by Egeland (2009) reveal that nearly all children (99%) ate country food in the month prior to the survey, and about one-third (33%) ate country food an average of 30 times or more during



Adapted with permission from Blanchet & Rochette, 2008
Data Source: Nunavik Inuit Health Survey, 2004

Figure 5.2

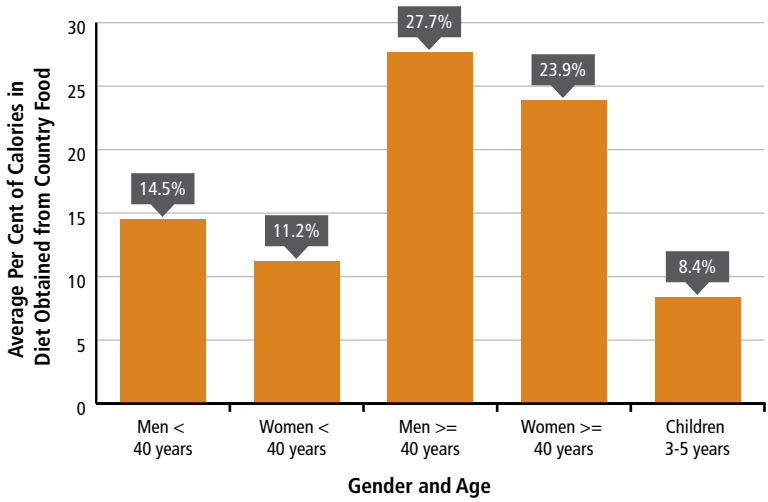
Percentages of Inuit in Nunavik Consuming Country Food in Different Seasons, 2004

Participants were asked to recall seasonal country food consumption during the year prior to the survey. There were clear seasonal variations in country food consumption, according to availability. For example, birds were consumed mainly in the spring, and fish and marine mammals were consumed more frequently during the summer.

25 Response options included "not at all," "a few times," and "often."

the same time period. Of households surveyed, 72% had an active hunter in the home. Figure 5.3 illustrates the rate of country food consumption among Inuit adult men, women, and children in Nunavut.

In looking at the data and evidence, the Panel observed that traditional/country food sources remain an important part of the diets of northern Aboriginal peoples and are enablers of food and nutrition security. Even in small amounts, they are excellent sources of key vitamins and minerals. However, as described in Chapter 6, the transition towards market food in northern Aboriginal communities, and in Indigenous communities globally, is ongoing. Changing food preferences and practices, along with the causes of changing food choices, are explored in Chapter 7.

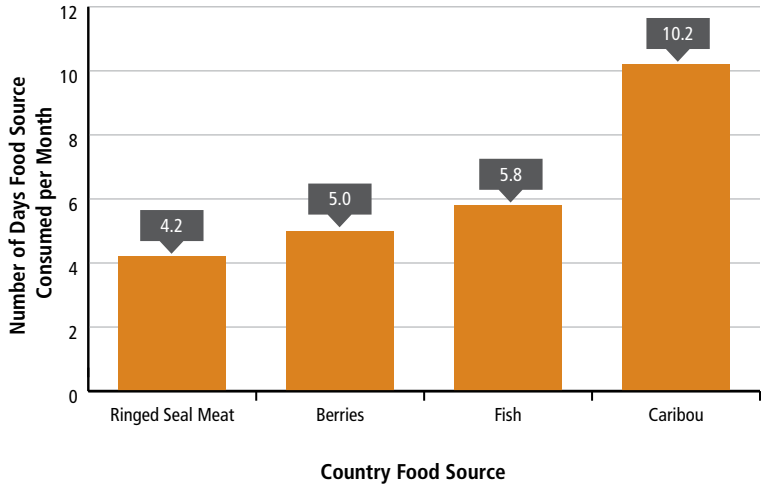


Data Source: Egeland, 2010c; Johnson-Down & Egeland, 2010

Figure 5.3

Percentage of Calories Inuit Men, Women, and Children Derived from Country Food Sources in Nunavut, 2007–2008

Based on 24-hour recalls from the IPY Inuit Health Survey, this figure reflects the percentage of calories derived from country food in Nunavut in 2007–2008. Older adults derived more calories from country food than did younger adults. The same was true for men compared to women. Children's diets had the lowest percentage of calories from country food sources.



Reproduced with permission from Egeland, 2009
Data Source: Nunavut Inuit Child Health Survey, 2007–2008

Figure 5.4

Average Number of Days Inuit Children in Nunavut Consumed Country Food in One Month

Parents of children aged three to five were asked to indicate how many times their children consumed different types of country food sources in the month prior to the Nunavut Inuit Child Health Survey. 388 children from 16 communities participated in the survey.

5.4 DETERMINANTS OF FOOD SAFETY AND QUALITY

The Food Safety Network (FSN, 2009) emphasizes that, until recently, most country food safety concerns were related to environmental contaminants (see Section 8.4 for more discussion on contaminants in traditional/country food). There has been minimal research on the risks associated with traditional/country food preparation practices, despite a need for risk reduction (FSN, 2009). In particular, there are risks related to animal health, consumption of raw meat, the practice of meat and fish "fermentation," and methods of harvesting and butchering. Traditional knowledge, the prevention of risk-agent growth, monitoring and surveillance, and education represent some of the primary methods for reducing risks associated with consumption of traditional/country food (FSN, 2009).

Many other factors beyond contaminants may affect the quality, safety, and taste of traditional/country food. A number of issues relate to the health of wildlife in northern Canada and have implications for human use and consumption. While not all are considered to be particularly harmful to human or animal health (WMAC & AHTC, 2009), pathogens affecting wildlife, including viruses, bacteria, and parasites, are important determinants of traditional/country food quality. However, wildlife disease surveillance in Canada is relatively recent. As a result, longitudinal trends can be identified for some diseases, but not others (Leighton, 2011).

Body condition is an additional determinant of food quality and taste. Those who hunt and prepare traditional/country food note that levels of body fat, as well as the condition of joints, meat, hair, and the liver, can signify the health of individual animals. For example, shiny animal hair is considered a marker of good health, whereas white, patchy hair on moose indicates the presence of ticks (Samuel, 2004), and uneven caribou hair with bumps on the skin or holes in the hide suggests the presence of warbles and bot fly larvae (WMAC & AHTC, 2009). The health of herds can also be estimated by the rate at which they move, the number of animals, and the strength of the leader (WMAC & AHTC, 2009).

Local and traditional knowledge from the Aboriginal people of Aklavik about the Porcupine caribou suggests that apart from regular seasonal influences, caribou meat has developed a different taste in recent years. Possible reasons cited by community members include the effects of ice road pollution and vehicular traffic, stress responses from animals being chased by snowmobiles, shifts in the diet of caribou, weather and climate-related events such as freezing rain, or increased distances in herd travel routes (WMAC & AHTC, 2009). This is similar to reports from Lutsel K'e Elders and hunters, where variation in the physical condition of Barren-ground caribou in the NWT was attributed to forest fire frequency and/or severity, declining availability and quality of vegetation, weather-related variables, human disturbance, and migratory distances (Lyver & Lutsel K'e Dene First Nation, 2005). This type of knowledge from Aboriginal Elders and hunters and community-based environmental monitoring programs can inform government, industry, and researchers on different characteristics of wildlife ecology, and potential environmental and human impacts (Lyver & Lutsel K'e Dene First Nation, 2005).

Traditional knowledge can be an important source of food safety information. For example, Inuit residents of Nunavut and Nunavik communities have noted that at certain times of the year, some people should avoid eating polar bear liver, narwhal brain, shellfish, aged meat and old food, black bear and polar

bear, and robins because of toxicity concerns (Myers & Furgal, 2006). Some types of meat (e.g., bear) tend to be eaten cooked to avoid parasitic infection (Proulx *et al.*, 2002), and some hunters use behavioural cues to assess the health of animals before killing them (WMAC, 2009a). As one local expert from Aklavik explained: "If a caribou is sick it won't run away. You leave that one […] sick or too old. You don't shoot that one" (WMAC, 2009a). Although the FSN (2009) notes that a substantial body of food safety knowledge appears to exist in Aboriginal communities and that Aboriginal people have survived for generations using traditional knowledge to prevent food-borne illness, little has been documented in this regard. The Panel determined that this represents a need for additional research.

5.5 COMMODITIZATION OF TRADITIONAL/COUNTRY FOOD

In northern Canada, major social changes are occurring alongside increased participation in the wage economy, including the commoditization of goods and services that were previously shared. While 2007–2008 IPY Inuit Health Survey results indicate that only 10% of Inuit surveyed across the ISR, Nunatsiavut, and Nunavut purchase their country food from stores (Egeland 2010a, 2010b, 2010c), the commercialization of country food requires consideration in this assessment, as it has the potential for complex positive and negative effects on food security in the North.

The commercialization of local food resources has been controversial among Aboriginal peoples, but it offers an opportunity to enhance community economies while creating jobs and activities that draw on local skills (Duhaime *et al.*, 2002, 2005; Furgal *et al.*, 2012). Informal sales among Inuit and non-Inuit have a long history; the federal government's Specialty Foods Program, introduced in 1960, was one of the first formal attempts to commoditize country food (Gombay, 2005). Territorial governments such as those of the NWT and Nunavut have sponsored programs to sell country food, including Nunavut's exploratory fisheries and pilot projects with land-based animals that were launched in the 1980s. The Panel noted, however, that much of the food processed was, and still is, exported to markets outside Nunavut. They also noted that coordinated programs across Nunavut have provided freezer facilities for both subsistence and commercial use in almost every community, with processing facilities constructed in a number of communities as well.

Gombay (2005) explains that in a contemporary context, country food selling among Inuit in Canada tends to be mediated by individual business people, regional Inuit Development Corporations, and hunter support programs, as presented below:

- **Individual business people:** This category includes formal or informal country food ventures, as well as harvesters who sell their catches to local stores and Hunter Support Programs (Nunavik), or Harvester Support Programs (Nunavut).
- **Inuit development corporations:** Examples of Inuit-owned development corporations that sponsor the commercial production of country food include Makivik Corporation's Nunavik Arctic Foods, Nunavut Development Corporation's Kitikmeot Foods Ltd. (Cambridge Bay, NU), Papiruq Fisheries Limited (Whale Cove, NU), Kivalliq Arctic Foods (Rankin Inlet, NU), and Pangnirtung Fisheries (NU), all of which provide federally certified meat and fish (Aarluk Consulting, 2005; Gombay, 2005). Nunavut Development Corporation's 2011–2012 *Annual Report* (NDC, 2012) revealed that while Pangnirtung Fisheries' Arctic char and turbot facility provided 35 jobs and drew a profit, it was the only food processing plant in the territory that did not lose money in 2012. The Torngat Fish Producers Cooperative in Nain and Makkovik, Nunatsiavut processes snow crab and Arctic char.
- **Hunter support programs and harvester support programs**: These programs are designed to support traditional harvesting practices and the production and consumption of country food. They are delivered through local HTOs or Hunters, Fishers, and Trappers Associations (HFTAs). Some support hunters by providing financial resources to cover a salary or daily rate and gas and supplies, while others may supply equipment to use while hunting for the community. Using the case of Nunavik, Gombay (2005) contends that hunter support programs (HSPs) represent the most accepted and successful form of country food commoditization: "At an ethical level, the HSP is tolerable to people because it both curbs the practice of selling country food purely for individual self-interest and underscores sociality by replicating the Inuit tradition of sharing food with the community." The Panel decided that this analysis could easily apply to similar programs across northern Canada.

The different levels of success attained by various commoditization efforts have largely been attributed to how the effort articulates with two main factors. These are, first, the ethical and cultural obligation to share certain kinds of food; and second, variations between the laws and regulations that affect how traditional/country food may be commoditized. These differ from region to region, depending on what is specified in land claims agreements (Gombay, 2005).

Using the example of Nunavut, Duhaime and Bernard (2008) remark that over the past 20 years, "significant effort and millions of dollars" have been invested in cultivating the country food sector, including developing country food markets and gaining European Union (EU) certification for some of the products. There is some indication that attitudes towards the sale

(informal or other) of country food in Nunavut communities, discussed in Myers *et al.* (2005), are changing. The Iqaluit country food market represents an example of support for this access in communities today. The sale of country food is emerging as an adaptation to the cost constraints of harvesting that is effective in some contexts (Gombay, 2005, 2009).

Box 5.5
Regulatory Issues and the Commoditization of Country Food in Nunavik

In an article on the commoditization of country food in Nunavik, Canadian researcher Nicole Gombay (2005) explains that both international and domestic regulations can limit the sale of country food. Examples include international conventions and treaties such as the *Migratory Birds Act* and the *Convention on International Trade in Endangered Species*, as well as restrictions on commercial whaling as per the International Whaling Commission, and actions such as the EU seal product ban. The negative impact of these policies and actions on northern Aboriginal peoples' ability to maintain subsistence harvesting practices, and the resultant impact on food security, cannot be underestimated.

In Canada, the trade of country food in Nunavik presents an interesting example. Under the JBNQA, the sale of country food outside of Nunavik, or within Nunavik to non-beneficiaries, is prohibited unless the products have commercial tags and meet provincial, federal, and/or international standards of slaughter and processing. As a result, food inspection regulations play a strong role in determining the conditions under which country food can be sold by Inuit and Cree living within the JBNQA area (Gombay, 2005).

Traditional/country food is also available from local stores in some areas, but this availability varies by community and over time. Indeed, a survey of Nunavut-based northern retailers on barriers to commercially processed country food revealed that availability was by far their greatest concern (83.3%), followed by price (47%) and consistency of product (25%) (Aarluk Consulting, 2005).[26] In interviews, retailers stated emphatically that, given a stable source of supply, they were very willing to market, showcase, and sell Arctic food (Aarluk Consulting, 2005). More research is required on this topic, including an assessment of the

26 This is based on the opinion of 12 respondents. Caution should be exercised in extrapolating from these limited results.

issues surrounding commercialization of traditional/country food and ways to level the playing field between market food and traditional/country food access (as identified by BDS, 2011).

The Panel noted the example of the Nelson House Community Food Program in northern Manitoba, which provides communities with access to healthy food while creating employment opportunities for workers who hunt and fish year-round. The food brought in by the workers is distributed for free among community members, reaching 1,500 people in a community of 2,500, while prioritizing sharing the food with Elders, the sick, and low-income, single-parent families (Kamal *et al.,* n.d.).

Although the development of local traditional/country food markets represents a promising practice to strengthen food security and food sovereignty, ventures that focus on exporting such food provide limited benefit to local food security. The Inuvialuit commercial muskox hunt on Banks Island, NWT (the largest commercial harvest of muskox in Canada) is one example. Managed by the Inuvialuit Regional Corporation and the Sachs Harbour HTO, animals are harvested in field abattoirs, where they are inspected by Agriculture Canada inspectors and veterinarians. The presence of a mobile abattoir mitigates some of the challenges described by Gombay (2005) in Box 5.5. However, much of the meat is sent to markets in the south, with some sales and intercommunity exchange; for example, Tuktoyaktuk in the NWT exchange beluga and caribou for muskox (Aarluk Consulting, 2005). As a result, northern residents, apart from some limited income from sales, do not seem to directly benefit from what would appear to create an increase in the local food supply. In a similar example, Nunavik Arctic Foods produces speciality caribou food products such as smoked caribou, caribou bourguignon, pâtés, and sausages; however, as well as the food being shipped south, most of the marketing and processing of these products occur in southern Canada (Aarluk Consulting, 2005), resulting in little benefit to local communities.

The literature presents several strategies for building food security and food sovereignty though enhanced local food production. These strategies are understood to create the potential to increase employment and make hunting a more viable future career path for younger generations, provide a source of economic gain at the individual and community levels, protect and promote the continuity of cultural skills and lifestyles, and ultimately increase the amount of nutrient-dense healthy food circulating and consumed in communities (Pearce *et al.*, 2006; BDS, 2011; RRPR, 2011). Other strategies identified by the Panel include the following:

- a commitment to the belief that existing natural and human resources have the capacity to enable northern peoples to become significantly more food self-reliant or food sovereign, alongside mechanisms and technology to support and encourage this in a more formal sense (Duhaime *et al.*, 2005);
- enhanced financial support for hunters through HSPs, greater access to food handling and processing skills training, the creation or continued support of community food stores, and a two-tiered system in which community facilities are linked to existing regional processing and distribution infrastructure (Myers *et al.*, 2004, 2005; Gombay, 2005);
- commercial harvesting of local products, coupled with state support of the food economy, to support food networks (where the ecosystem carrying capacity can support this growth in exploitation, as is the case in Greenland) (Duhaime *et al.*, 2002); and
- greater investigation and consideration of transportation and storage infrastructure in northern regions, to support supply and distribution of locally harvested and regionally imported food. This is in addition to the improvement of maritime connections for transportation, subsidies to equalize the consumer price index, an emphasis on local and regional commercialization, and more integration of hunting into the formal cash economy of communities (Duhaime *et al.*, 2005).

As traditional/country food processing and distribution systems develop, the line between traditional/country and market food becomes less clear, and factors affecting food security may no longer be unique to one source or the other (Gombay, 2005). For example, the option to purchase traditional/country food in stores means that food prices would affect access to traditional/country food, and the risks and benefits associated with traditional/country food would also apply to some market food. The commoditization of traditional/country food may, therefore, be conceptualized as both an enabler of and a barrier to food security in the North.

More northern Aboriginal peoples are moving from a traditional/country food system to a market/imported food system for reasons of availability, accessibility, and cost. Together, these two food systems make up Canada's northern food system. Chapter 6 reviews the market food system, and Chapter 7 examines the nutrition transition, a dietary transition towards more consumption of market food.

5.6 CONCLUSIONS

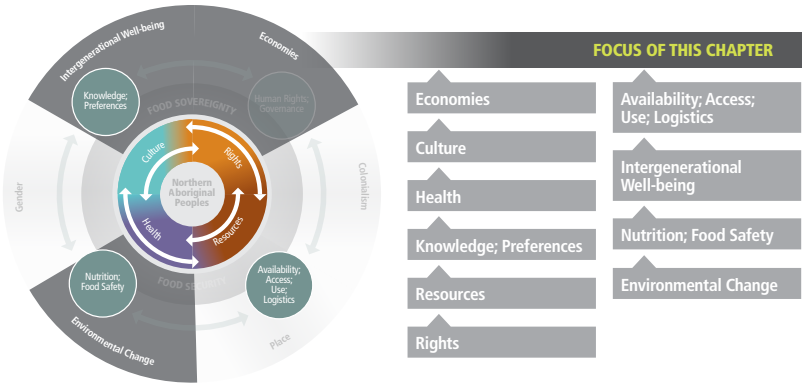
Traditional/country food is an enabler of food and nutrition security, food sovereignty, and health and wellness in northern Canada. Even in small amounts, it is an excellent source of important vitamins and minerals. While traditional/country food is consumed in varying amounts across northern Canada (due to variables such as age, gender, level of education, community size, and region), data indicate that participation in harvesting activities and the consumption of traditional/country food has been declining in Aboriginal communities. In addition, although these types of food continue to be shared, major social, environmental, cultural, and economic transitions are affecting this traditional practice.

6

The Market Food System

- Market Food Pricing
- Market Food Consumption in the North
- Logistical Issues Surrounding Market Food and Cost
- Future Logistics: Climate Change, Development, and Transportation
- Conclusions

6 The Market Food System



Key Findings

Market food is significantly more expensive in northern communities than in southern ones.

The most frequently consumed market food products are of relatively low nutritional value when compared with nutrient-dense traditional/country food. Even a single portion of local animal or fish food results in increased levels of energy, protein, and many essential vitamins and minerals.

The high costs of transportation, warehousing, and distribution of food in northern Canada are important factors affecting food security at various levels, particularly access to, and availability of, imported market food.

An expansion of economic activity and the significant changes due to climatic processes are resulting in increased use, opportunities, and threats to the Arctic marine and coastal environments. Although industrial development can benefit communities, it can also negatively affect land, wildlife, water, and community health.

This chapter introduces readers to the other main food system in northern Canada, the market/imported food system. The Panel adapted the following definition of *market food* based on the *Nunavut Food Guide Educator's Handbook* (GN, 2012): *Store-bought food* refers to foods that generally cannot be sourced

from the land locally. These may be healthy (vegetables, fruit, grain products, etc.) or unhealthy (items higher in sodium, fat, and sugars). In addition, although all country foods (food from the land, sea, and sky) are nutritious, not all store-bought foods are.

The health, nutritional, and social importance of the traditional/country food system in northern Canada is recognized and increasingly acknowledged. However, with the rising cost of harvesting traditional/country food, and the loss of traditional harvesting practices, Aboriginal communities are faced with further pressure to provide enough food (Boult, 2004). The availability of traditional/country food is also influenced by the amount of time and personal energy available to harvest and prepare traditional cultural food items (Kuhnlein & Receveur, 1996). These combined financial and physical costs are too high for many families dependent on low-wage incomes insufficient for the northern cost of living or for those on social assistance; efforts to avoid these costs can foster a continued dependence on equally or more expensive store-bought food (Boult, 2004).

6.1 MARKET FOOD PRICING

The high price of food in the North is a significant factor in any discussion of food security. Using data from IPY Inuit Health Survey aggregate results from Nunavut, the ISR, and Nunatsiavut, Rosol *et al.* (2011) found that the average weekly cost for groceries across these regions in 2007–2008 was $380 per week, or $19,760 per year. In comparison, 49.6% of Inuit adults earned less than $20,000 in the previous year (Rosol *et al.*, 2011). In the ISR, the average household in 2007–2008 spent $1,317 per month on food, whereas the average Canadian household spent $609 in 2007 (Egeland, 2010a).

The Nunavik Comparative Price Index (Duhaime & Caron, 2012) demonstrates that identical food baskets cost 81% more in Nunavik than in Québec City. While the price difference is smaller for perishable food products (45%) than for non-perishables (86%) or frozen food (100%), Duhaime and Caron (2012) note that perishable products represent a small portion of all products available in grocery stores and tend not to be readily available in Nunavik. In Saskatchewan, the cost of a 2008 National Nutritious Food Basket for a family of four was $205.02 per week, but, in northern Saskatchewan,[27] the cost was

27 Including the health regions of Athabasca, Keewatin Yatthé, and Mamawetan Churchill River.

$252.27 per week (PHNSWG, 2010). Similarly, the cost of a nutritious food basket in Newfoundland (excluding the Labrador region) averaged $178.84, while, in rural areas of Labrador, the cost was $229.37 (FSNNL, 2012).

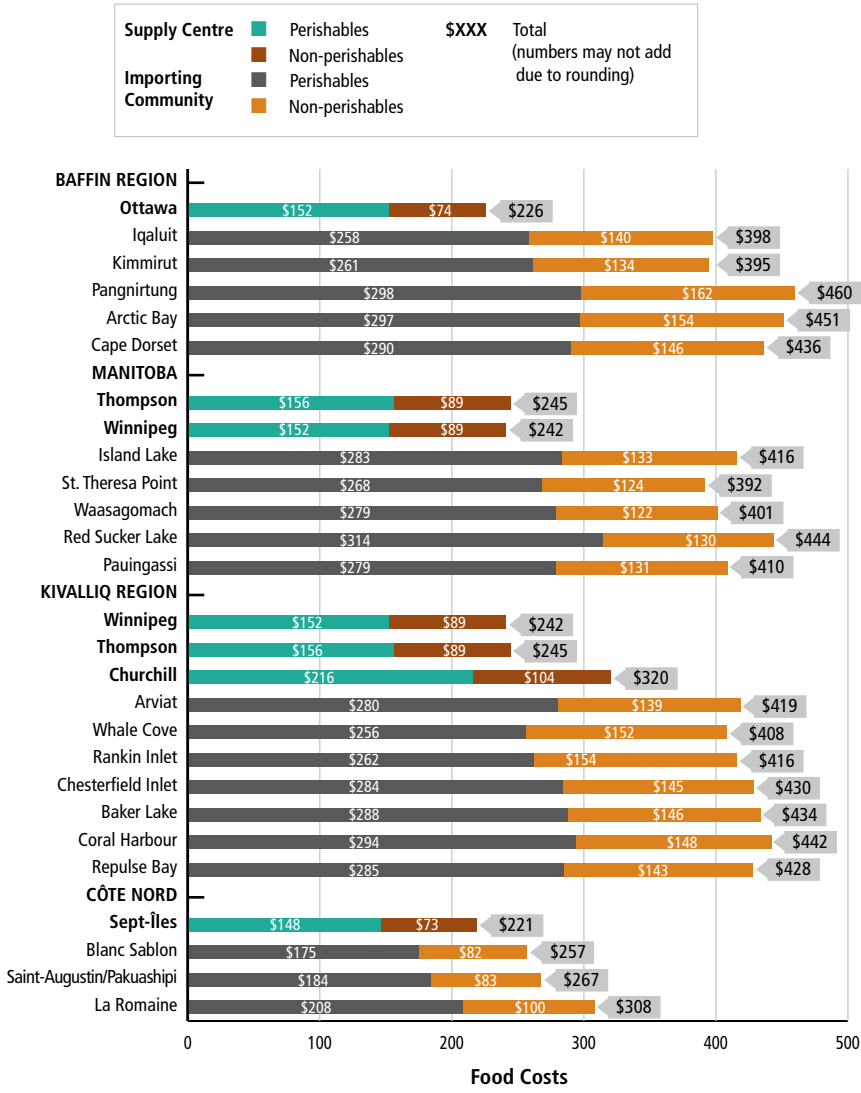
To further illustrate the costs of food, the Revised Northern Food Basket estimates the weekly cost of nutritious food for a family of four across several northern regions in 2010 (AANDC, 2010d). The difference in price between major southern food supply centres and northern communities is highlighted in Figure 6.1.

Perceptions of country food costs compared with market food costs vary across the North. Results from the 2007–2008 IPY Inuit Health Survey indicate that the majority of Inuit respondents from the ISR (60.7%) and Nunavut (76.1%) believed that country food was less expensive than market food compared with under half (43.3%) of respondents from Nunatsiavut.

6.2 MARKET FOOD CONSUMPTION IN THE NORTH

Percentages of total energy intake from market food and traditional/country food reported by adult northern women and men from the three Aboriginal populations vary by food groups. Kuhnlein & Receveur (2007) report on dietary recall studies from adult Yukon, Dene, Métis, and Inuit men and non-pregnant/non-lactating women, and Yukon and Dene children conducted over two seasons. Results were adjusted for season, day of week, and culture. They found that among market food groups, grains, sweet and fat (foods with sugar or fat as primary ingredients), and meat each accounted for more than 15% of total daily energy intake. While the percentage of energy from all traditional/country food varied by community setting (17-28% by cultural average), there was a consistently greater percentage derived from market food. This was especially so among the children assessed, where the traditional/country food component was much less than for adults.

Based on these 24-hour dietary recall studies, Kuhnlein & Receveur also found that tea, sugar, white bread, biscuits, lard, crystal powdered drinks, instant coffee, evaporated milk, corn flakes, soft drinks, butter, and eggs were among the most frequently consumed market food products. Less frequently consumed market food products included fat from solid shortening, dry soup mixes, rice, meat products, macaroni and cheese, and frankfurters. The meat products available were in variable condition, and often were preprocessed, precooked, or frozen. Other types of foods, such as fruits and vegetables, are not always accessible in northern communities (Ford & Beaumier, 2011), or can be beyond the expiration date for food quality/safety or of lesser quality



Reproduced with permission from AANDC, 2010d

Figure 6.1

2010 Weekly Cost of the Revised Northern Food Basket for a Family of Four: Supply Centres Compared to Selected Northern Communities

The figure compares the cost of food in remote communities to that in the supply base. The Panel noted that the location of these communities has little bearing on the cost of food. For instance, the cost of food in Iqaluit, Nunavut is lower than that in Red Sucker Lake, Manitoba, because small communities such as Red Sucker Lake have short runways and can only accommodate aircraft carrying up to five to seven tonnes. On the other hand, Iqaluit and Rankin Inlet have runways that can accommodate jet service. As a result, although distances may be much greater, the cost per tonne for transport may be similar.

due to the time needed to transport food over large distances (Boult, 2004). The need for education on the healthy preparation of market food has been described as a knowledge gap in communities (Ford & Beaumier, 2011).

The most frequently consumed market food is of relatively low nutritional value when compared with nutrient-dense traditional/country food. When the dietary data from more than 3,800 individuals (Kuhnlein and Receveur, 2007) were analyzed separately for days with or without one or more servings of traditional/country food, the days with traditional/country food consistently had significantly more energy, protein, and 11 vitamins and minerals. Even a small portion of traditional/country food can provide important amounts of energy, protein, and essential vitamins such as vitamins B2, D, E and B6; iron, zinc, copper, magnesium, manganese, phosphorus, and potassium (Kuhnlein & Receveur, 2007; Gagne *et al.,* 2012). Traditional/country meats and fish are low in saturated fats; and sea mammal tissues have surprisingly high levels of vitamin C (Fediuk *et al.*, 2002; Kuhnlein & Receveur, 2007). Traditional and country food sources are extremely important contributors to quality diets of northern Aboriginal children and adults (Kuhnlein & Receveur, 2007; Chan *et al.*, 2006).

6.3 LOGISTICAL ISSUES SURROUNDING MARKET FOOD AND COST

A large proportion of Canada's land area lies north of all-weather roads or rail lines (see Figure 6.2) (Prentice & Russell, 2009). The concept of "remoteness" applies not only to locations physically far from other settlements. Economics, as opposed to distance only, also determines remoteness. Without accessible transportation, "any location becomes remote" (2012). For example, although Anchorage, Alaska may be far from other settled areas in the United States and Canada, it is not necessarily remote because it is connected to the lower 48 states via a modern airport, a harbour, and an all-weather road (Prentice, 2012). Conversely, communities such as Pauingassi, Manitoba (about 280 kilometres northeast of Winnipeg), or those located on the Lower North Shore of Quebec such as Harrington Harbour (which is less than 200 kilometres from Corner Brook, Newfoundland), can be considered remote because they lack year-round transportation.

The logistics of food sales in northern Canada consist of important factors that affect food security at various levels, particularly access to, and availability of, imported market food resources. Vast geographic distances, sparse populations, and harsh cold weather conditions, which are becoming more unpredictable as a result of climate change, all make northern Canada a difficult place to conduct trade. Logistical elements identified that can make communities vulnerable

to food insecurity include inadequate infrastructure for food processing, food production, or safe drinking water, as well as a lack of roads and federal wharfs (Thompson *et al.*, 2011).

Adapted with permission from Prentice & Russell, 2009

Figure 6.2

Approximate Northern Limit of Connecting All-Weather Roads and Rail Lines

A vast portion of Canada is not served by connecting all-weather roads or railways, such as the area shaded in green. A few roads, such as those going north into Quebec, James Bay, and Yellowknife, are single routes, as opposed to boundaries with roads below them. Communities in the regions shaded in green mainly rely on air- and ocean-based transportation for long-distance travel.

6.3.1 Transportation

Remoteness has significant implications for the 4% of First Nations people in Canada who lack road access (Thompson *et al.*, 2011). As an example, 23 First Nations in Manitoba (accounting for half of the province's First Nations population) are not accessible by an all-weather road (AANDC, 2012b). This will take over 25 years to change even with a major project to create year-round access to 13 isolated communities on the east side of Lake Manitoba (ESRA, 2011). Furthermore, Nunavut does not have any roads that connect communities.

Some are accessible by snow machine in winter, but travel is mainly by air or water; all of Nunavut's 25 communities depend on summer open-water access (GN, 2003). Across northern Canada, seasonal shutdowns, uncertainty of travel with winter roads not freezing over, infrequent transportation service, and low traffic density contribute to expensive logistics (Prentice & Russell, 2009).

The following list outlines the most common modes of transportation used to access communities across northern Canada, as well as their associated challenges:

- **Marine transport:** The least expensive form of transportation available to communities with open water access is seasonal sealifts via ships and barges. However, sealift deliveries are dependent on climate, weather, and the movement of ice, and are typically limited to two or three deliveries per year (Prentice & Russell, 2009; Prentice, 2012; Flood, 2012).
- **Air transport:** Helicopters and airplanes are also capable of serving northern Canada, although these forms of transportation have serious limitations. Helicopter-based transportation is expensive and cargo space is limited, and airplanes require runway infrastructure with sufficient length and surface covering to enable landing and take-off. Costs of flying cargo diminish with increases in plane size, but higher costs for longer landing strips, or sufficient lake-ice thickness, represent challenges (Prentice & Russell, 2009; Prentice, 2012).
- **Ice roads:** Trucks or cat-trains (a series of sleds pulled by a Caterpillar tractor or a traction machine) can ship heavy cargo to remote communities on temporary ice roads, which often cover difficult terrain and are subject to weight load restrictions and the risks of climate change. The costs of building one kilometre of ice road over tested routes that do not require clearing can range from $3,500 to $6,000; new routes require land permits and are much more expensive. Over 5,000 kilometres of ice roads are constructed in Manitoba and Ontario annually, and they tend to be open from late January to early March. The season during which trucks can use the roads appears to be shortening due to climate change (Prentice & Russell, 2009; Prentice, 2012).

In addition to the cost of fuel, the cost of transport to remote communities is higher for several reasons (Vodden, 2013). Very few locations offer any return loads. Consequently, shippers to the North often have to pay the full round-trip costs of a journey. Several remote locations lack fuel for sale. Some airplane operators do pre-position and store fuel using ice roads or barge, but, failing this, the transport vehicle has to carry sufficient fuel for the round trip. This reduces the space available for cargo or passengers. Where water crossings are necessary, spring break-up and fall freeze-up periods interrupt any transport (for example, on ferries) and can

cause lost utilization of equipment (see CBC News, 2012; Flood, 2012). Finally, ice roads are rough and can damage tires, springs, and steering systems; the length of time required and the risks involved contribute to transportation costs. Rates over ice roads can be roughly double the cost of normal road haulage (ESRA, 2011).

A new, emerging generation of cargo airships expands the options for transport in seasonally accessible and remote areas (Prentice & Russell, 2009; Prentice, 2012; Adaman, 2013). An airship is a lighter-than-air vehicle that appears to offer a lower-cost alternative for cargo shipments to remote areas (SCTIC, 2013) (see Figure 6.3). A potential advantage over conventional aircraft is that airships possess the flexibility to carry irregularly shaped and bulky loads in their cargo bays and can also carry awkwardly shaped freight as slung loads. They have few infrastructure-related requirements other than shared hangars for maintenance, and fuel requirements per kilogram of cargo are expected to be far less than those of airplanes (SCTIC, 2013). Runways for take-off and landing are not required. Compared to conventional aircraft, the competitiveness of airships for cargo shipments has yet to be determined because modern airships have not yet been used for commercial cargo operations (SCTIC, 2013). However, military investments in the United States have encouraged the development of lighter-than-air technology over the past six years. High winds and extreme cold are unlikely to limit airship operations in northern Canada more than any other aircraft. A graduate thesis study of food distribution in northern Manitoba, Ontario, and the Kilvalliq region of Nunavut found that this method of transportation could diminish the cost of transporting food to northern residents by 18 to 55% (Adaman, 2013).

Figure 6.3

Examples of Airships

From left to right: For future consideration, there are airships, such as Hybrid Air Vehicles (United Kingdom, military prototype) and Varialift Airships (United Kingdom, concept validation). Each is expected to have a payload capacity in excess of 20 tonnes.

6.3.2 Other Logistical Costs

As noted earlier, the retail price of food in a southern distribution point can be less than half the price in the North. The direct cost of transport, however, may account for only 10 to 20% of this difference (Sorobey, 2013). The balance is made up of all the other logistical costs, such as inventory holding, shrinkage, labour, buildings, and energy. In turn, these costs have the high cost of transportation embedded in their supply. For example, the high cost of energy is in part based on the high cost of transporting and storing fuel and power generators.

The logistics of operating stores to sell market food in remote northern communities are much different than in southern Canada. Two major businesses operate the majority of grocery stores across northern Canada: the North West Company (NWC) and Arctic Co-operatives Limited (ACL). One hundred twenty-two Northern stores and seven North Mart stores operate under the NWC (NWC, 2013a). Northern sells food and general merchandise in remote northern Canadian communities in Yukon, Nunavut, NWT, Saskatchewan, Quebec, Ontario, Newfoundland and Labrador, Manitoba, British Columbia, and Alberta. Some locations offer branded food service, including KFC, Pizza Hut, Burger King, and A&W (NWC, 2013b). North Mart targets larger northern markets, "with an emphasis on an expanded selection of fresh foods" as well as general merchandise, clothing, and health products and services (NWC, 2013a). Some North Mart locations include Quickstop, Fun 2 Go, and "hot deli" services, which offer a variety of branded food services and hot and cold beverages such as coffee, frozen drinks, and fountain drinks.

ACL is a service federation owned and controlled by 31 community-based, cooperative business enterprises located across the NWT and Nunavut (ACL, 2012). Incorporated in 1972, ACL employs over 900 people. In addition to retail stores, these independently owned Inuit and Dene organizations provide hotel and tourism operations, cable television, arts and crafts marketing, fuel distribution, construction and heavy equipment services, property rental, and various agency-type services (ACL, 2012).

The costs of market food storage for an entire season include costs surrounding large warehouses and fuel storage tanks (Prentice & Russell, 2009), as well as the costs of fuel itself. Longer transportation distances also make it more difficult to transport perishable goods before spoiling, further increasing costs of more nutritious fresh food and reducing its acceptability to consumers. Inventory shrinkage has a double impact. Not only is the value of the goods lost, but all

the costs of moving and storing the goods are lost, too. The Panel discussed the significance of the "best before date" on non-perishable food. While food may still be safe to consume after this date, consumers may not want to buy it.

The high costs of transportation are also embodied in all goods and materials used in northern retail logistics. For example, wood from shipping pallets is valuable, especially above the tree line, and it is rarely returned south (Sorobey, 2013). A store that could be built in six months in southern Canada can take three years to construct in a remote community. The store can also be three times as expensive to run due to the high costs of importing skilled labour and the increased expense for building, construction, and maintenance on permafrost (Sorobey, 2013). These overhead costs must be built into the retail prices of food.

Energy is another factor in food costs. In 2011 average energy prices in Nunavut were 74.9¢/kWh, ranging from 52.39¢/kWh in Iqaluit to 102.71¢/kWh in Kugaaruk (CBC News, 2011). In comparison, average residential electricity prices were 11.84¢/kWh across 12 major Canadian cities (Hydro-Québec, 2012). The high cost of electricity has a direct impact on the cost of distributing food in the North. Electricity is needed for heating, lighting, and operating temperature-controlled displays, and the cost of food must cover these electrical costs.

The Panel noted that while little other research exists on the logistical challenges of transportation, storage, and distribution of market food in northern Canada, these factors clearly contribute to the costs of food there. Considering the critical role of logistics in the process of providing commercial food (imported market food and possible processed traditional/country food) to the Canadian North, this knowledge gap warrants further investigation.

6.4 FUTURE LOGISTICS: CLIMATE CHANGE, DEVELOPMENT, AND TRANSPORTATION

The logistical situation in the North is also changing rapidly. Climate change has been identified as a main driver of increased industrial development in the Canadian North (AMAP, 2007; ICC, 2011; NSIDC, 2012), and mining, oil and gas, shipping, and tourism are all predicted to increase in the coming decades. These activities have implications for the ecological health of the region. The Arctic Council has addressed some of these matters, in particular, a number of issues related to oil spill response guidelines and shipping. The 2013–2015 Canadian Chairmanship has prioritized "responsible resource development, safe Arctic shipping, and sustainable circumpolar communities" (Government of Canada, 2013).

Increased economic activity and significant changes due to climatic processes are resulting in increased use, opportunities, and threats to the Arctic marine and coastal environments. Land activities affecting the Arctic marine area include oil and gas activities, mines, industrial complexes, harbours, and human settlements. The marine pollution effects are, with few exceptions, mostly local (Arctic Council, 2013). According to the Arctic Monitoring and Assessment Programme (AMAP), oil and gas activities in the marine portion of the Arctic are more restricted than activities on land (AMAP, 2007). Industrial development can introduce local economic benefits for northern Aboriginal peoples but also negatively impact land, wildlife, water, and community health (AMAP, 2009b; GRID-Arendal, 2009). Increased ship traffic serving resource facilities, however, may be an avenue for less expensive shipping of market food (AMAP, 2009a). New runways and roads may also increase the availability of market food. The Panel concluded that more research is required on the effects of natural resource and other development on food security and the health of northern Aboriginal peoples.

Changes in existing critical transportation infrastructure throughout northern Canada may influence the transportation of market food and thus affect its access and affordability in small, remote communities where many items are already prohibitively expensive (GRID-Arendal, 2009). More research is also required on how climate change may affect existing infrastructure such as roads and runways. Some authors, such as Butler Walker *et al.* (2009), identify several factors likely to affect communities and food security in northern Canada in the near future, many of which pertain to the logistics of market food. These include increasing costs for imported food and transportation, increasing uncertainty of transportation, effects of climate change on weather conditions and transportation infrastructure, and food storage challenges. Regional representatives at a Transport Canada workshop on climate change and transportation reported that some significant impacts to transportation infrastructure were already present in 2003 (Transport Canada, 2003).

The impact of climate change on transportation varies by latitude and geography. Areas served by marine transport are generally benefitting from a longer shipping season (e.g., Churchill, MB); new harbours (e.g., Nanisivik, Pangnirtung); and possible route changes. However, industry experts report that heavy equipment used to off-load barges is having trouble on the softer ground due to melting permafrost at the shoreline (Gaudreau, 2013). A longer open-water season with decreasing sea-ice coverage and extent is expected to provide greater boat

access to coastal communities throughout the year and make ship and barge transportation more viable. Airlines report that gravel runways are becoming too wet during certain times in the spring and fall (Vodden, 2013). Work by Allard & Lemay (2012) in Nunavik, which has no road network, reports the instability of airstrips as a result of current permafrost warming. These new conditions were not previously anticipated.

Box 6.1
East Side Transportation Initiative, Manitoba

This recently commenced road-construction initiative to create year-round access to 13 isolated communities on the east side of Lake Manitoba is projected to:

- lower freight costs of essential supplies by 50% and medical cost transport by 40%;
- reduce greenhouse gas emissions by 30%, or an estimated 16,700 tonnes per year;
- save 6.1 million litres of fuel per year as a result of shifting travel from air and winter roads to an all-season road system;
- create 22,000 person-years of direct employment and approximately 15,000 person-years of indirect employment; and
- reach 872 kilometres in length and cost approximately $2.7 billion.

The East Side Road Authority's business plan has called for an investment of approximately $1.125 billion over the next 15 years. No funding has been announced for the balance of the road network at the time of writing.

(ESRA, 2011)

Where all-weather roads exist in permafrost areas, dangerous sink holes are developing, while communities dependent on ice roads are experiencing greater risk concerning annual resupply of goods. For example, the 2,200-kilometre winter road system connecting remote and northern communities in Manitoba to the south of the province is usually open for about eight weeks per year. In 2010, however, the roads were open for less than a month (CBC News, 2010). The new East Side Transportation Initiative (see Box 6.1), in addition to mitigating road safety concerns and providing year-round road access to 13 communities, is expected to lower the freight costs of goods and essential services by 50% and the cost of medical transport by 40%, if it is actually constructed (ESRA, 2011).

6.5 CONCLUSIONS

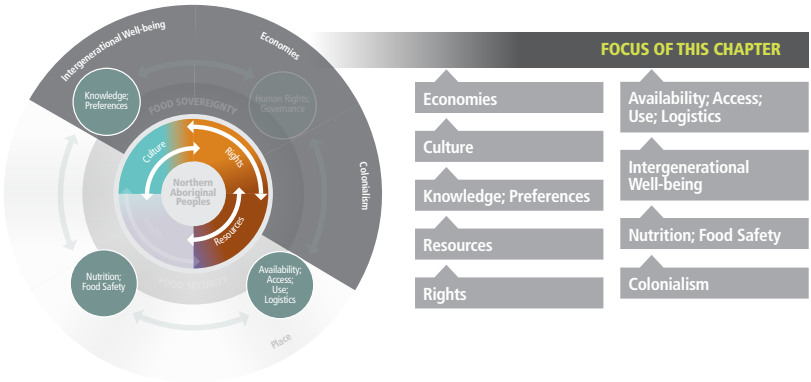
In addition to traditional/country food, market food represents the other main food source in northern Canada. Due to the high costs of transportation, warehousing, and distribution, market food is significantly more expensive in northern communities than in southern ones. The implications of these prices are particularly serious considering the prevalence of low-income households across the Canadian North, as well as the rising costs of traditional/country food. In addition, the most frequently consumed market food products are of relatively low nutritional value when compared with nutrient-dense traditional/country food. Increased economic activity and significant changes as a result of climatic processes are resulting in increased use, opportunities, and threats to Arctic marine and coastal environments. These developments bring both challenges and opportunities for the achievement of food sovereignty and food and nutrition security.

7

The Nutrition Transition in a Mixed Economic System

- Mixed Economies in the North
- Poverty, Food Costs, and Food Insecurity
- Declining Consumption of Traditional/ Country Food
- Conclusions

7 The Nutrition Transition in a Mixed Economic System



Key Findings

Northern Canada has a mixed economy, where subsistence and wage economies exist along a continuum. Food sharing networks remain an important activity of northern cultures and economies. As a process, these networks help integrate subsistence and wage-earning activities in a social network.

A combination of market food and subsistence food systems is generally the practice in northern Aboriginal communities today. The shift to purchased food is particularly evident among younger generations, women, and communities with more access to market food.

Social, economic, cultural, technological, political, and environmental changes have ushered in the nutrition transition. This transition refers to the shift from nutrient-dense, traditional/country food to market (store-bought) food and the resulting increases in chronic disease.

The high cost and level of knowledge needed to select and prepare relatively newly introduced market food are barriers to accessing healthy market food in northern Aboriginal communities.

Poverty is a significant compounding factor in obtaining adequate nutrition from either traditional/country food or market food.

continued on next page

The high cost of gas and hunting and fishing supplies (which necessitates wage-earning employment) is a barrier to food security and food sovereignty.

Evidence suggests that nutrition interventions must focus on activities designed to increase individuals' intentions to eat more healthy food. If nutrition education and intervention initiatives are to be successful, food choice, food beliefs, and healthy behaviours must be considered.

Set in the context of the mixed economic system that is prevalent in many northern communities, this chapter builds on Chapters 5 and 6 to present the Panel's findings on the ongoing dietary shift from traditional/country food to market food. Determinants of food choices such as poverty and food costs, changing harvesting practices, food preferences, and generational differences are cast as elements contributing to this shift.

Although the native animals and plants of the land, water, ice, and sky have been important to northern Aboriginal peoples' traditional/country food systems for millennia, livelihoods in the North have been rapidly changing since the 1950s (Gombay, 2005). Industrialization and globalization have accelerated the shift away from traditional subsistence livelihoods. This is alongside the impacts of colonialism and its legacy, including residential schools, which have imposed multigenerational effects and challenges with which communities are still reconciling. Increasing contact with the global economy has created changes in local governance and regulations, a transition from subsistence to wage economy, the introduction of formal education systems, population growth, media and advertising influences, and new transportation technologies. These social forces are transforming community livelihoods and contributing, in part, to a decrease in traditional/country food practices and an increase in market (store-bought) food consumption (Kuhnlein *et al.,* 2001; Usher, 2002; Nuttall *et al.*, 2005; AHRN, 2009; Furgal, *et al.*, 2012). This nutrition transition among many Indigenous communities globally has also seen concomitant — and documented — health effects, from predominantly communicable (infectious) diseases to non-communicable (non-infectious) diseases such as those relating to obesity, cardiovascular disease, and other serious health issues (see Chapter 3) (Kuhnlein & Receveur, 1996; Damman *et al.,* 2008).

7.1 MIXED ECONOMIES IN THE NORTH

A combination of market (store-bought) food and subsistence food systems is generally the practice in northern Aboriginal communities today (Kuhnlein, 1992; Ferguson, 2011). Known as the *nutrition transition* (Kuhnlein *et al.,* 2004;

Sharma, 2010; Egeland *et al.,* 2011; Sheikh *et al.*, 2011) because of the resulting effects on diet, nutrient intake, and health, this shift is clearly occurring in northern Canada, although it varies by cultural group (Kuhnlein *et al.,* 2004) and region (Tait, 2001; Blanchet *et al.,* 2002). The shift to purchased food is particularly evident among younger generations (Wein *et al.,* 1990; Morrison *et al.,* 1995; Samson & Pretty, 2006; Natcher *et al.*, 2012a), women (Delormier & Kuhnlein, 1999; Chan *et al.*, 2006; Sheikh *et al.,* 2011), and communities with greater access to store-bought food (Receveur *et al.*, 1997). Winona LaDuke explains that "the nature of northern indigenous economies has been a diversified mix of hunting, harvesting and gardening, all utilizing a balance of human intervention or care, in accordance with these religious and cultural systems' reliance upon the wealth and generosity of nature" (LaDuke, 2002).

Since traditional practices for many northern Aboriginal peoples involve living off the land, a cash-based system was not used (Mary Simon in the film *Qapirangajuq: Inuit Knowledge and Climate Change*, 2010). For example, the Gwich'in of the NWT led nomadic lifestyles where they hunted, fished, and gathered 75 to 100 species of plant and animal wildlife (Kuhnlein *et al.*, 2013a). Small communities emerged after a trading post was established in the mid-1800s, and the Gwich'in population settled year-round in the 1960s (Kuhnlein *et al.*, 2013a). Similarly, northern Manitoba communities were relatively self-sufficient until the 1950s (NFPPSC, 2003).

While some communities maintain various levels of food self-sufficiency (NFPPSC, 2003), colonialism, resulting in the loss of land and resources, has brought about material poverty in many Aboriginal communities across Canada (LaDuke, 2002, in Thompson *et al.*, 2011). Canadian government policies of the 1950s, which relocated Inuit away from small villages of extended families into a few large settlements in new locations, represent only one example of how northern Aboriginal peoples became increasingly and distinctly implicated in the market economy (Wenzel, 2009).

The economic make-up of most Aboriginal households is heterogeneous (Natcher, 2009). Some household members may participate in subsistence harvesting; others may produce and sell value-added products derived from the land (e.g., fur, carvings); some may receive government transfer payments (e.g., employment insurance, social assistance, pensions); and others may be involved in full or seasonal wage-earning labour. Rather than participating in any single activity, most households attempt to find a balance, with household incomes derived from multiple sources. Depending on a variety of circumstances, community members often move along this continuum with most households participating simultaneously in multiple activities (Natcher, 2009; Natcher *et al.*, 2012b).

Food sharing networks remain an important activity of northern cultures and economies (see Chapter 5). As a process, these networks help integrate subsistence and wage-earning activities in a social network (Chen, 2006). Wage earning can allow for greater access to traditional/country food, either through direct harvest or exchange networks. For example, a father may receive money from a daughter employed in the community daycare facility. With the money, the father purchases fuel and supplies to fish for Arctic char. Of the 500 pounds of char caught, he sells 100 for $1.75 per pound. He returns this $175 to his daughter for her initial investment and distributes the remaining 400 pounds of char — with an exchange value in the local cooperative or Northern store of $2,000 — to friends and family (scenario adapted from Simpson, n.d., as presented in Natcher, 2009).

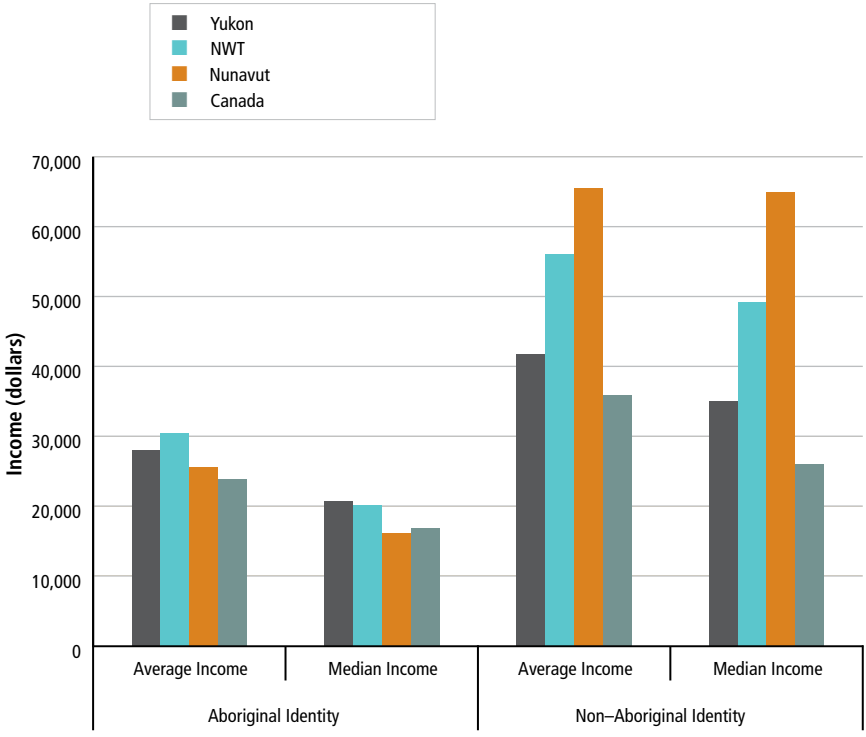
Nuttall and colleagues (2005) characterize the complementary nature of subsistence and wage-earning economies as an "optimal" economy (optimal has a normative, rather than technical, meaning). In today's North, a cash-free society is neither possible nor desirable, but the current situation is the result of the emerging response to the reality of shifting economies.

7.2 POVERTY, FOOD COSTS, AND FOOD INSECURITY

The degree to which Aboriginal peoples rely upon market-based diets varies considerably by region and other socio-demographic factors (Earle, 2011). However, the literature indicates that, as with traditional/country food, the ability to access and select nutritious market food is increasingly dependent on the ability to pay (Kuhnlein & Receveur, 1996; Chan *et al.*, 2006; Chabot, 2008; Loring & Gerlach, 2009). A 2011 report on the opportunities and barriers to the provision of nutritious and culturally appropriate food in community-based programs and services in Nunavut identified several cost-related challenges, including the high cost of market food; a lack of access to country food; a lack of knowledge of how to select the best food on a budget; and a dearth of infrastructure for storing, preparing, and serving food (Hamilton *et al.*, 2011). As a result, the Panel found that poverty is a significant compounding factor in obtaining adequate nutrition from either traditional/country food or market food.

Food insecurity is strongly linked to low income (FBC, 2012). For many Aboriginal peoples living in northern Canada, especially, the effects of high food costs, and the high costs of living in general, are intensified by the effects of low income and unemployment. Although average and median incomes tend to

be higher at territorial levels than at the national level, the gap between the incomes of Aboriginal and non-Aboriginal people is more pronounced in the territories (see Figure 7.1).



Adapted with permission from Collin and Jensen, 2009

Figure 7.1
Differences in Income Between Aboriginal and non-Aboriginal Populations, Canada and the Territories, 2005

FNRHS 2008–2010 data on respondents in 16 communities of the Dene Nation (NWT) are also illustrative of income levels. Sixty-seven per cent of households reported an annual income of less than $50,000, and 46% of households reported an annual income of less than $30,000 (Dene Nation, 2012). By comparison, as of 2010, the mean after-tax economic family[28] income at the national level

28 An economic family is a group of individuals sharing a common dwelling unit who are related by blood, marriage (including common-law relationships), or adoption.

was $78,800, and the median census family income[29] before tax was $69,860 (Statistics Canada, 2013e; Statistics Canada, 2012b). Employment rates across the Dene Nation varied by age group: about 30% of adult respondents under the age of 30 across the Dene Nation worked for wages or were self-employed, compared with about two-thirds of adults aged 40 to 49. Further evidence on employment comes from the NWT Bureau of Statistics. A six-month average in 2009–2010 showed that 83.2% of the non-Aboriginal population was employed, compared with 44.8% of the Aboriginal population (GNWT, 2010a).

In 2007–2008 a high percentage of households across northern Canada had a member who received income support,[30] ranging from 20% in ISR to 50% in Nunavut (Egeland, 2010a, 2010b, 2010c). For First Nations people living on-reserve in Canada more generally, the 2010–2011 income assistance dependency rates were about 34%, compared with about 5% in the rest of the Canadian population (AANDC, 2012c).

Issues related to low income, such as household crowding, living in public housing, having a home in need of major repairs, or living in a single-adult household, are variables associated with household food insecurity (Huet *et al.,* 2012). To put this in perspective, FNRHS data from the Dene Nation indicate that less than half of respondents owned their homes, 26% of homes required major repairs, 31% required minor repairs, and the presence of mould or mildew was reported in 23% of all homes (Dene Nation, 2012). Between 20% and 40% of all respondents to the FNRHS indicated they had to struggle to meet basic needs (food, shelter, utilities, clothing, transportation, child care) a few times a year, monthly, or more often than monthly (Dene Nation, 2012). Varying amounts and eligibility for subsidies can aggravate income disparity. For instance, young hunters may be disadvantaged by having to pay rent, while older hunters have their housing subsidized (Collings, 2005).

Poverty has clear implications for food security because it in part determines what types of food people have available and what they can afford to purchase (Loppie Reading & Wien, 2009), along with whether they can afford to access country food. This point is highlighted in the 2011 *Poverty in Nunavut* report, commissioned by the Government of Nunavut, which suggests that two main factors are at the nexus of food insecurity in the territory: poverty and declining levels of access to country food (Impact Economics, 2011). While these may

29 Census families include couple families, with or without children at home, and lone-parent families with at least one child living at home.

30 Public programs to maintain and protect standards of living — especially to replace income lost due to pregnancy, illness, accident, death or absence of a breadwinner, unemployment, old age, etc.

seem like two clearly delineated problems, the authors note that several other factors intersect these issues. For example, inadequate finances are an issue for many Nunavummiut, but the effects of low income may be compounded by a lack of education about nutritious market food choices, by addiction, or by social exclusion. From their interview-based research on the role of financial resources as a determinant of Inuit women's food insecurity, Beaumier and Ford (2010) drew similar conclusions, noting that although income is indeed important, it can only be understood in a larger socio-cultural, historical context.

Several studies demonstrate that poverty not only limits the extent to which individuals and families can access market food but also makes the costs associated with contemporary hunting out of reach for many (Chan *et al.*, 2006; Loppie Reading & Wien, 2009). Results from Lambden *et al.* (2006) show that up to 50% of Yukon First Nations, Dene/Métis, and Inuit women had inadequate access to fishing and hunting equipment, and up to 46% of women could not afford to go hunting or fishing. Kuhnlein *et al.* (2013a) also found that access to hunting and fishing equipment was limited to 40 to 45% of women's households in Tetlit Zheh, a First Nations Gwich'in community in the NWT. Men and women from across the Dene Nation reported that in addition to increases in the cost of hunting and fishing, the increased cost of fuel for heating homes appeared to reduce the funds that were available to go out on the land (Kuhnlein *et al.*, 2013a). In other words, engaging in traditional activities such as hunting, fishing, harvesting, and trapping has been found to be increasingly expensive, and high costs associated with harvesting have continued to limit the ability of many Aboriginal harvesters to continue their activities. Boult (2004) notes that the Nunavut Harvesters Support Program has estimated more than $200 in operating costs (for gas, ammunition, food, etc.) to conduct a weekend hunt. Rising gasoline prices are making some climate adaptations more expensive and out of reach for some households; many adaptations to changing ice conditions involve developing new but longer trail networks (Beaumier & Ford, 2010).

7.3 DECLINING CONSUMPTION OF TRADITIONAL/ COUNTRY FOOD

The nutrition transition is resulting in an increased intake of carbohydrates and saturated fats, such as instant noodles and bread, and is projected to change the future incidence of chronic diseases among northern Aboriginal peoples (e.g., increases in obesity, diabetes, and heart disease) (Egeland *et al.*, 2011). Data indicate that consumption of traditional/country food has been declining over time, an issue also discussed in Chapter 5 (Blanchet & Rochette, 2008).

For example, Sheikh *et al.* (2011) compared survey results from 24-hour dietary recall studies in 18 Inuit communities in 1998–1999 with 2007–2008 results. In this 10-year period, the energy contribution from traditional food decreased significantly (from 23.4% in 1999 to 16.1% in 2008, $p \leq 0.05$), and market food consumption as a percentage of daily energy necessarily increased significantly. Results from 2007–2008 indicate that the percentage of energy from traditional food decreased more for women (11.3%) than men (2.9%), and women consumed significantly less energy from traditional food than did men.

Schuster *et al.* (2011) studied food consumption patterns in the context of food security in two Yukon First Nations communities in 2007–2008, using the same food frequency questionnaires employed in a study from the early 1990s, to identify potential temporal trends. Results showed that although the overall frequency of total traditional food consumption did not change in either community, there was a difference in frequency of consumption of certain types of traditional food (e.g. rabbit was eaten less often, but fish was eaten more often). The limited availability of some food species, the access to harvesting equipment, and decreases in time available to go out on the land to harvest are all food security challenges facing more households today.

Demographic characteristics show a significant influence on food choice. In both survey periods of Sheikh *et al.* (2011), older adults consumed more total dietary energy from traditional food than did younger adults. Country food as a percentage of total dietary energy significantly declined for women, from 39.7% in 1999 to 28.4% in 2008 (Sheikh *et al.*, 2011), demonstrating the greater vulnerability of women to food insecurity.

While young people (under age 40) are still consuming traditional/country food to various degrees, research clearly indicates a downward trend in traditional/country food consumption among youth, along with greater consumption of market food than among older populations (Wein *et al.*, 1990; Kuhnlein *et al.*, 2004). The transition to market food is particularly evident in the results of a 2000–2001 24-hour recall study of food use among Dene/Métis and Yukon children in five communities during two seasons (Nakano *et al.*, 2005). The researchers found that, due to dietary preferences and availability, traditional food accounted for less than 5% of energy intake among children aged 10 to 12, although children in the more northern communities consumed significantly more traditional food.

7.3.1 Influences on Food Preferences and Harvesting Practices

Despite the ongoing nutrition transition, many northern Aboriginal peoples continue to choose traditional/country food when it is available to them. The 2008 IPY Inuit Health Survey found that 20 to 25% of households preferred to eat country food, while the rest preferred a mix of country and store-bought food (Egeland, 2010a, 2010b, 2010c). Across Nunavut, Nunatsiavut, and the ISR, caribou meat and Arctic char were the most often consumed country food, and in the largest quantities (Egeland, 2010a, 2010b, 2010c). In addition, over 75% of households in these regions indicated their preference for eating more country food than was available to them. Inuit in Nain, Nunatsiavut readily expressed numerous reasons for liking country food, based on physical aspects (taste, freshness, variety, and healthfulness); advantages for health and wellness; links to identity (e.g., "it just makes me who I am"); and connections to communities, land, and history (Pufall *et al.*, 2011). In comparison, very few reasons to dislike country food were cited.

Nakano *et al.* (2004) found that 79% of Yukon and Dene/Métis women preferred traditional meat over store-bought meat. In the community of Sanikiluaq, Nunavut, Wein and colleagues (1996) observed that most country food types were well liked by adults and teen youth.[31] However, adults expressed a stronger preference for 25 of 32 country food types compared with youth, while youth (compared with adults) expressed more of a preference for two of nine market food types. Results from the 2004 Nunavik Inuit Health Survey (Blanchet & Rochette, 2008) describe opinions on traditional/country food, including liking the taste (51%), perceiving it as healthy (42%), considering it part of Inuit traditions (30%), and believing it provides strength and warmth (21%).

The primary causes limiting country food intake in Nunavut include not having an active hunter in the home, lack of access to transportation, time off wage-earning employment when animals are near communities and in season, and the high cost of gas and hunting and fishing supplies (Egeland, 2010a, 2010b, 2010c). Survey data from Yukon First Nations, Dene/Métis, and Inuit women indicate that they enjoy eating traditional/country food and believe in its health-giving properties (Lambden *et al.*, 2007). However, inadequate access to hunting and fishing equipment and the cost of hunting and fishing are identified as major barriers to food security (Lambden *et al.*, 2006).

Culture and changing ways of life also shape or reinforce food choices and preferences. Preferences are predicated on exposure to different food types. Wein *et al.* (1996) observed that more young people than adults had not tasted

31 Between grades 6 and 11.

some types of country food in Sanikiluaq, NU. They concluded this was a result of ways of life in settled communities compared with those in seasonal camps, the decreasing prevalence of trapping of fur-bearing animals that also provide food, and less frequent travelling and camping on the land in general. In another example, Bernier *et al.* (2003) examined factors motivating traditional food choices among Inuit populations in Nunavik. Their findings suggest that the main factors included ease of access, feelings associated with food choices (likes and dislikes), beliefs related to values, habits, and cultural attitudes (e.g., healthy/unhealthy). Similar factors explained motivations to eat store-bought food, with the addition of having a "taste" for market food, and external barriers or facilitating conditions (e.g., cost, availability). Country food safety concerns (see Chan *et al.*, 1995) have also been cited as a factor that is linked with food preferences (Pufall *et al.*, 2011) (see Chapter 8 for an extended discussion).

Shifts in food preference may be reflected in changing harvest rates. Evidence indicates that participation in harvesting is declining (Parlee & Furgal, 2012; Dinero, 2013). Not all households have an active hunter. Harvesting activities are not evenly distributed across all households, and it is thought that 30% of community households harvest 70% of all harvested food and that these "super harvesters" play an important role in northern communities. The population in the North has a younger demographic, and younger households have less time to harvest. As Condon *et al.* (1995) explain, an overall decrease in subsistence hunting participation is characteristic of younger generations. Social, economic, and political changes in northern Canada have had "profound" influences on the youngest cohorts of Aboriginal adults, most of whom represent the first generations to be exclusively raised within the contexts of centralized communities. Islam and Berkes (2012) illustrate these trends using data from the Cree Hunters and Trappers Income Security Board of Quebec. The population of eastern James Bay Cree more than doubled between 1976–1981 and 2004–2008. However, the population participating in the Hunters Income Security program (and spending at least four months on the land, as required for eligibility in the program) declined from 3,200 to 2,300 people over the same period. Compared with the total population, the decline was dramatic: the percentage of people going out on the land declined from 45.7% (nearly half of the population) in 1976–1981 to 15.3% in 2004–2008 (see Table 7.1). As further evidence, data from the NWT show that from 1999 to 2009, the percentage of persons aged 15 and older who hunted or fished during the previous year decreased from 42.0 to 39.4%, and the percentage who trapped dropped from 8.0 to 6.2% (GNWT, 2010b).

Table 7.1
Participation of Eastern James Bay Cree in Hunters Income Security Program, Quebec

	1976–1981	1989–1994	2004–2008
Resident Population	7,000	11,000	15,300
Participant Population	3,200	3,000	2,300
Percentage Participation	**45.7**	**27.3**	**15.3**

Adapted with permission from Islam and Berkes, 2012
Data Source: Cree Hunters & Trappers Income Security Board, Quebec

Condon *et al.* (1995) suggest that despite recognition of the continued importance of subsistence harvesting, there is a growing lack of interest among young Inuit in subsistence hunting and fishing. The reasons for this include inadequate training in traditional techniques of hunting and fishing; insufficient access to required funds to purchase equipment; changing dietary preferences; lack of desire to participate in economic activities that are becoming less commercially viable (e.g., seal harvesting and trapping); increasing dependence on wage employment that limits the time available for going out on the land; and increasing interest in organized sports. The complexities of harvest may be seen in the example of the bird egg harvest by the Inuvialuit. In Nunatsiavut in 2007, Natcher and colleagues (2012a) found that the most significant limiting factor influencing the harvest of migratory bird eggs was lack of interest among Inuit harvesters. Other factors included financial limitations, such as the prohibitive cost of fuel to access egging sites, a perceived decline in the number of eggs available that season, time limitations associated with work and school, and physical and health-related challenges that limited ability to engage in harvesting activities. The lack of interest in harvesting migratory bird eggs was identified more or less consistently by all age cohorts, but was greatest among those between the ages of 20 and 29.

Egg harvesting was influenced in other socially differentiated ways. For example, among all Nunatsiavut egg-harvesting households (n=221), those characterized as mature (n=148, or 67%) — where heads-of-household were between the ages of 40 and 59 and had young adult children residing at home — accounted for 63% (5,888 eggs) of the total egg harvest. In addition to having the greatest relative need in terms of household size, these households also had the labour and financial resources necessary to harvest eggs effectively (see Natcher, 2009). The second-largest harvesting group was active Elders (n=31), characterized as heads-of-household over the age of 60 who still participated in harvesting activities. Representing 14% of all egg-harvesting households, this group accounted for 19% (1,776 eggs) of the total egg harvest. With a tendency towards

a tradition of egg gathering, and a dietary preference for migratory bird eggs, these households have kept egg harvesting a priority in their seasonal round of subsistence activities (Natcher *et al.*, 2012a).

Usher's (2002) review of surveys documenting Inuvialuit use of the Beaufort Sea and its resources from the 1960s to 2000 is informative. He found that while the geographic extent of harvesting remained relatively stable, the mean annual harvest of country food per hunter decreased from 2,083 to 707 kilograms per year. The overall number of harvesters increased, but by less than the rate of population growth. Usher also noted a transition away from marine country food sources and towards terrestrial sources. The author attributed many of these changes to the decline of both the sled dog team (marine harvests were a primary food source for dogs) and the fur trade. Further evidence comes from Berkes *et al.* (1995), who concluded that the lifestyle and activity patterns of First Nations harvesters in the Mushkegowuk region of northern Ontario had significantly changed in recent decades, including shorter trips on the land. These trends can be generalized across much of the Canadian North, based on data from the Royal Commission on Aboriginal Peoples (RCAP, 1996).

Change in resource use is complex and cannot be accounted for simply by acculturation, age, household development, or dietary preferences. The land-based economy of the North has, over the past century, been driven by changing government policy positions, which at times encourage Aboriginal people to be self-sufficient harvesters of wildlife and at other times encourage (or coerce) them to abandon subsistence harvesting altogether (Procter, 2012). While they do influence harvesting patterns, the above factors fail to capture the social, economic, and ecological complexities that influence wildlife harvesting from year to year, such as temporal and spatial changes in species distribution and abundance (Natcher *et al.*, 2012a). These, in turn, are related to regional variation in habitat, non-human predation and changes in the biophysical environment, anthropogenic disturbances, and the continuance of adaptive conservation practices.

7.3.2 Determinants of Food Choices

The nutrition transition is well underway in northern Canada. This transition varies by age, gender, and region, but its effects on nutrition and health, its relationship with poverty, and its implications for intergenerational knowledge transmission remain relatively consistent.

The transition towards market food, especially among younger generations, has sharpened the focus of the importance of knowledge and education for making healthier market food choices. Limited knowledge about selecting

and preparing relatively newly introduced market food and food budgeting is cited frequently in reports of community members' perspectives on factors influencing their food choices (Chan *et al.*, 2006; Lawn & Harvey, 2009; Mead *et al.*, 2010a; Ford & Beaumier, 2011). The lack of availability and affordability of healthy food can also inhibit healthy market food choices among First Nations, Métis, and Inuit populations (Chan *et al.*, 2006; Lambden *et al.*, 2006; Skinner *et al.*, 2006).

Mead and colleagues (2010a, 2010b) explored determinants of healthy food choices among adult Inuit from the NWT and Nunavut using qualitative interviews with community stakeholder groups and questionnaires with community members. Their analysis of survey results reveals that one of the most important factors influencing healthy food choices is self-efficacy and the intention to eat more healthy food. An interesting finding was that knowledge of healthy food did not necessarily result in greater self-confidence in the ability to engage in healthy food choices. Financial resources certainly impacted dietary choices and behaviours. The study concluded that nutrition interventions to improve healthier choices should concentrate on activities designed to increase an individual's intention to eat more healthy food. Examples of such activities were skills training at point-of-purchase locations, such as cooking classes and shopping on a budget (Mead *et al.*, 2010a, 2010b).

Related results about healthy intentions were gleaned from interviews and surveys with Fort Albany First Nations youth and adults in northern Ontario that highlighted the importance of improved income and food affordability, but focused particular attention on building greater community capacity and increasing community-level initiatives such as school snack programs and community greenhouses (Skinner *et al.*, 2006, 2012). These studies, however, all point to the importance of using various strategies to promote a culture of "healthier living," which in turn is central to ensuring practices that will promote healthy lifestyles. The Panel noted that these findings are similar to those demonstrated in larger surveys of determinants of food choices.

If nutrition education and intervention initiatives are to be successful, food choice, food beliefs, and healthy behaviours must be considered. This area was identified by Willows (2005) as a knowledge gap in the determinants of healthy eating in Aboriginal communities. This social perspective points to the food patterns expressed by groups of people, such as families or entire remote northern communities, and which are understood to be reinforced by socially structured conditions such as employment, education, and the income opportunities of households and communities (Delormier *et al.*, 2009). As Raine (2005) observes, research has yet to determine how collective-level factors — policies, economic

trends, political contexts, and cultural norms — reinforce certain patterns of eating that are not necessarily healthy. Although the assets, talents, and abilities of communities can act as key sources of resilience, it is important to look beyond individual food decisions and consider how society, including the unique historical context of Aboriginal people in Canada, configures opportunities such that some have more choices than others (Delormier *et al.*, 2009). The Panel hopes that future research will address this important knowledge gap.

7.4 CONCLUSIONS

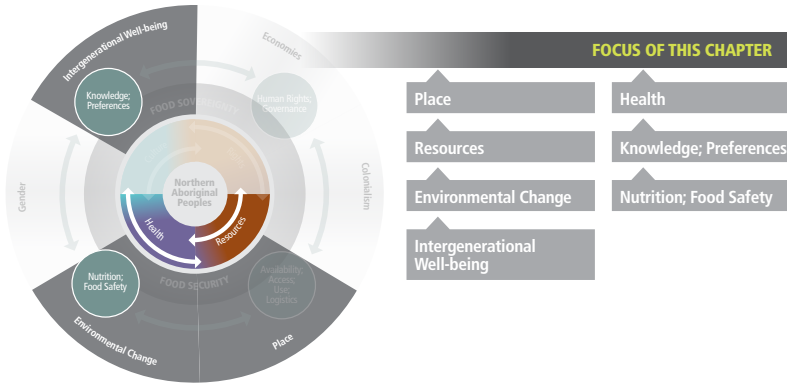
As a result of increasing contact with the global economy, social forces, such as a transition from subsistence to wage economy, changes in local governance, population growth, media influences, and new technologies are transforming community livelihoods in northern Canada. These social forces are contributing, in part, to a decrease in traditional/country food practices and an increase in market food consumption. While the nutrition transition varies by cultural group, it is particularly evident among younger generations and communities with greater access to store-bought food. The nutrition transition, occurring among Indigenous communities globally, has also seen documented health effects. These include the emergence and increase of communicable and non-communicable diseases, as well as other serious health issues. One of the outcomes of colonialism is material poverty in many Aboriginal communities across Canada, which negatively and seriously affects peoples' ability to obtain adequate nutrition. Addressing poverty and unemployment in northern Aboriginal communities so that individuals and communities can achieve sustainable livelihoods is a key step in mitigating food insecurity. The nutrition transition has also sharpened the focus of the importance of knowledge and education for making healthier market food choices, but if these initiatives are to be successful, food choice, food beliefs, and healthy behaviours must also be considered.

8

Environmental Change

- Climate Change in Northern Canada
- Natural Resource Development Impacts
- Wildlife Abundance and Availability
- Contaminants and Traditional/Country Food
- Emerging Diseases Affecting Wildlife
- Adaptation to Environmental Change
- Conclusions

8 Environmental Change



Key Findings

Opportunities for younger generations to learn and transmit traditional knowledge about the land, wildlife, and harvesting are increasingly challenged by environmental, social, economic, and cultural changes.

Important populations of traditional/country food species in northern Canada are changing in quantity and quality due to environmental and anthropogenic forces. Changes to migration routes, population size and new disease incidences impact the overall health of northern food species (e.g., land and marine mammals, fish, and berries).

Land use changes from resource exploration and development activities, including extractive industrial activities, impact northern Aboriginal peoples' traditional/country food security, health, and wellness, and must be better understood.

Decreased availability of, and access to, subsistence food reduces the food security and nutritional status of northern Aboriginal people and accelerates the nutrition transition to market foods.

Although many environmental contaminants are decreasing in concentration as the result of regulation and international agreements, a wide spectrum of contaminants are still found in northern ecosystems. These raise concerns for the health of Inuit, who are most at risk, and for other northerners who depend on certain species for food. However, the benefits of a healthy and nutritious country food diet continue to outweigh the risks of contaminant exposure through the northern food chain.

This chapter focuses on three of the factors framing the Panel's conceptual model: environmental change, place, and intergenerational well-being. Throughout the chapter, these factors are linked with natural resources to draw out the complex connections among food security/sovereignty, subsistence species of northern plants and animals, and the realities of contaminants and climate change, including emerging diseases affecting wildlife and adaptive strategies. Some of these connections are more direct than others, and the ongoing process of climate change means that effects are not fully understood. Nonetheless, they represent important considerations in this holistic analysis of food security and northern Aboriginal health.

8.1 CLIMATE CHANGE IN NORTHERN CANADA

According to the most recent Intergovernmental Panel on Climate Change (IPCC) Assessment Report results, the loss of Arctic sea ice has increased in every season, and in every successive decade since 1979. Scientists are predicting significant trends towards an ice-free Arctic summer in the near future (IPCC, 2013). Scientific data and local observations have demonstrated that rapid, unpredictable, and sometimes irreversible climatic changes are occurring in the Arctic (IPCC, 2007; 2013), changes that could have profound effects on ecosystem health and people's lives (Anisimov *et al.*, 2007; CAFF, 2010; UNEP, 2013). It is widely recognized that climate-driven change is affecting northern Aboriginal communities and their environments (Nickels *et al.,* 2005; Guyot *et al.,* 2006; Nancarrow & Chan, 2010), and that the climatic changes occurring in the Arctic are more distinct and explicit than anywhere else in the world (ACIA, 2005; NATO, 2011). Due to their dependence on climate-sensitive resources for their livelihoods and cultural survival, along with the sensitivity of Arctic ecosystems to climate change, researchers have identified northern Aboriginal peoples as particularly affected by these changes (ACIA, 2005; Furgal & Prowse, 2008).

As documented in a draft of the IPCC's 5th Assessment Report (2013), the Arctic region will warm more rapidly than the global mean, which will be more significant over land than over the ocean. There is much evidence to support the occurrence of substantial Arctic warming since the mid-20th century. Air temperatures over extensive land areas in the Arctic continue to experience an increase of temperature (IPCC, 2013) (see Box 8.1).

Box 8.1
Climate Scenarios and Food Security

Several international, comprehensive, peer-reviewed studies have definitively identified anthropogenic activities as a major causal factor of climate change. These reports have all concluded that the Arctic is particularly vulnerable and have linked climate change to environmental and human health impacts in the Arctic (IPCC 2007; 2013; ACIA, 2004; Prowse & Furgal, 2009; Carmack *et al.*, 2012; UNEP, 2013). While estimates vary, recent research points to an upward long-term trend in warming in the Arctic. For example, relative to the 1981-2000 baseline, ACIA-designated composite models predict that by the end of the 21st century, annual mean temperatures will increase by 3 to 4ºC (and upwards of 7ºC during the winter) in the western Canadian Arctic. During the same timeframe, air temperatures are expected to increase by 3 to 9ºC around southern Baffin Island and the Hudson Bay area in the winter, although less warming is predicted during other seasons (Weller *et al.*, 2005). While the effects of these changes will be particularly pronounced in polar regions, which are increasingly recognized as "extremely vulnerable" to current and projected climate change, their consequences will be felt around the globe (ACIA, 2005; Anisimov *et al.*, 2007). There are serious implications for food security as animal species diversity, ranges, and distribution change, as vegetation zones shift, and as thawing permafrost disrupts transportation and infrastructure (ACIA, 2004). These changes will impact availability and access to both traditional/country food and market food.

8.2 NATURAL RESOURCE DEVELOPMENT IMPACTS

The Mackenzie Valley Pipeline Inquiry, led by Justice Thomas Berger (1977), documented the social, environmental, and economic impacts of a proposed gas pipeline through the Yukon and NWT. Citing evidence gained through hearings based in 35 communities during his three years in the North, Berger deemed the potential impacts to outweigh the benefits of the pipeline at the time. He recommended that no pipeline should be built across the northern Yukon, and that a 10-year moratorium on the project should be enacted to address some of the potentially "devastating" effects of the pipeline, such as impacts related to ways of life, conservation, and land claims concerns. Since the release of the report, resource development in the North has proliferated. New evidence has been gained from social and scientific research, as well as community-based knowledge.

For example, a 2008 roundtable attended by representatives of First Nations, Inuit, and Métis communities and organizations discussed the opportunities and challenges of resource development in northern Canada (NAHO, 2008a). Food security emerged as a central concern related to extractive development activities, including how wildlife and traditional/country food access may be affected (NAHO, 2008a). A bibliography produced by NAHO (2008b) indicates that while an abundance of literature exists on the environmental impacts of resource extraction, much less literature has been produced about the other effects of resource development (e.g., social, cultural, economic, political, and gender-based issues). In the NWT, community monitoring data indicate that mining activities are associated with a decrease in participation in hunting and fishing activities among residents of larger centres (e.g., Yellowknife), but an increase in participation in smaller communities (e.g., Behchoko) (GNWT, 2012). This is possibly explained by the positive impact of these developments on average annual household income and the need for economic resources to purchase and maintain basic equipment for hunting and fishing. The Panel concluded that more research is likely required to investigate the links between food sovereignty, food security, and the effects of ongoing natural resource development, and, in particular, mining.

8.3 WILDLIFE ABUNDANCE AND AVAILABILITY

Biodiversity trends and indicators are a helpful way of understanding ecosystem and wildlife health. As an example, the Arctic Species Trend Index (McRae *et al.*, 2010) tracks 965 populations of 306 species, which represent 35% of known vertebrate species living in the Arctic. Between 1970 and 2004, abundance in vertebrate species declined by 26% in the High Arctic. Low Arctic species experienced an increasing abundance during this time, while Sub Arctic species have declined since the mid-1980s (McRae *et al.*, 2010). Current bans on the harvesting of caribou exist in Nunatsiavut and regions of the NWT because of estimates of low numbers of animals.

As noted by GRID-Arendal (2009), climate change poses a specific threat to traditional/country food security in the North because it affects wildlife abundance and availability, the extent to which humans can access wild food, and the safety and quality of traditional/country food. For example, the people of the Deh Gah Got'ie First Nation (NWT) and Beaver Creek (Yukon) have noted changes in species, water levels, weather, and ice patterns (Guyot *et al.*, 2006); the Denesoline of Lutsel K'e (NWT) reported recent declines in duck and goose populations as well as shrinking water tables (Berkes *et al.*, 2005);

Labrador communities have reported that lower water levels in rivers and ponds have negatively impacted access to and health of fish species (Furgal *et al.*, 2002; Nickels *et al.*, 2005); and dwindling caribou populations have been recorded across the NWT (Fisher *et al.,* 2009). The Peary caribou, for example, has been listed as "endangered" under the federal *Species at Risk Act* since 2011 (Giroux *et al.,* 2012), and under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) since 2004 (COSEWIC, 2011a). COSEWIC has reported that Peary caribou's population has declined by 72% over the last three generations. This is mostly due to "catastrophic" die-offs, which are caused by starvation due to severe icing events. Their continuing decline, coupled with predicted changes in long-term weather patterns, places this species at "imminent" risk of extinction (COSEWIC, 2011b).

Survey results by the Government of Nunavut suggest that the South Baffin Caribou Herd has declined by 95% in the last 20 years (Jenkins *et al.,* 2013). Elders and hunters from communities on southern Baffin Island have reported that caribou are more difficult to find and have expressed concerns about the negative impacts of land use and other factors on caribou and their habitat. The survey cites climate change, disease, and anthropogenic activities, including mineral development and unrestricted harvest, as possible threats to the herd (Jenkins *et al.,* 2013). Recent surveys of the Beverly caribou, whose range covers parts of the NWT, northern Saskatchewan, northern Manitoba, and Nunavut, also show a decline of almost 50% from 1994 to 2011 (Campbell *et al.,* 2012).

Other researchers have also documented the effects of climate change and variability on wildlife numbers, distribution, and accessibility in northern Canada (Ford *et al.*, 2006, Ford & Pearce, 2010; Ford & Beaumier, 2011). The implications of their observations are that with decreasing availability of, and access to, subsistence food species, there will likely be reductions in the food security and nutritional status of northern Aboriginal peoples — accompanied by an accelerated nutrition transition (Egeland *et al.,* 2013). The expansion of southern species into northern regions, introduced species, and species hybridizations, such as that seen between the polar bear and grizzly in the ISR (Derocher, 2010), may impact important food species and subsistence hunting (Humphries *et al.*, 2004). The impact of climate change, however, is not always uniform and negative. For example, a study done in Naujaat and Kugaaruk in Nunavut reported that climate change observed in the two communities was community specific, inconsistent, and affecting the country food harvest in both positive and negative ways (Nancarrow & Chan, 2010).

Direct impacts of climate change on wildlife abundance and distribution are only some of the ways that environmental change affects northern food security. Various communities and scholars have identified climate change as having made traditional practices more dangerous in which to engage, related to, for example, unpredictable and early break-up of sea ice and the resulting inability to hunt at certain times of the year (Nickels *et al.*, 2005; IPCC, 2007; Furgal, 2008; Furgal & Prowse, 2008; Pearce *et al.*, 2009). Hunters interviewed for *The Sea Ice Is Our Highway* (2008),[32] an Inuit Circumpolar Council (Canada) report, indicated that they had to travel further to access wildlife, and formerly safe travel routes had become insecure due to a warming climate and melting ice. Higher winds and dangerous travel conditions around Nunavut and Nunavik communities have also limited opportunities for hunting seals and whales in open water (Ford *et al.*, 2006; Nickels *et al.*, 2005). In the ISR, Nunavut and Nunavik, it has been observed that ice thickness is decreasing and the length of the ice-free season is extending as a result of warmer winter temperatures. This has increased the risks associated with hunting and reduced access by hunters to ice-based wildlife such as ringed seal, narwhal, and polar bear (Ford *et al.*, 2006; Nickels *et al.*, 2005). The connection between sea-ice loss and hunting is not always straightforward. For instance, Gearheard *et al.* (2006) found that although hunters are able to adapt in many ways, they may find it strange to be hunting from a boat at times of the year when they would normally expect to hunt by snowmobile or dog team atop the ice.

Conditions under which younger generations learn and transmit traditional knowledge about the land, wildlife, and harvesting are also being transformed, with negative implications for current and future food security. For harvesting expeditions to be viable, a well-developed understanding of ice conditions, weather patterns, and migratory routes of animals is required (Dowsley & Wenzel, 2008; Beaumier & Ford, 2010; Wong *et al.,* 2011). Transmission of traditional environmental knowledge is impacted by new and unreliable weather patterns and shifting environmental conditions, reinforcing reduced participation in hunting among youth. It is also affected by the reality of declining numbers of experienced full-time hunters in northern communities (Beaumier & Ford, 2010). Box 8.2 presents a selection of research projects that aim to facilitate knowledge exchange on this topic.

32 *The Sea Ice Is Our Highway: An Inuit perspective on transportation in the Arctic*, a contribution by the Inuit Circumpolar Council to the Arctic Council's Arctic Marine Shipping Assessment.

Box 8.2
Climate Change and Traditional Knowledge

Several major national, international, and collaborative projects are investigating the relationships between climate change, traditional knowledge, and land use. These include 2008–2009 IPY projects such as Sea Ice Knowledge and Use (SIKU), the Inuit Sea Ice Use and Occupancy Project, the Circumpolar Flaw Lead Study, and the Arctic Council's ongoing Circumpolar Biodiversity Monitoring Program. The SIKU-INUIT-HILA Project, a collaborative project between the communities of Qaanaaq (Greenland), Clyde River (Nunavut), and Barrow (Alaska), along with the University of Colorado and Inuit Circumpolar Council (Greenland), have reported on the changes noticed by local residents and the way in which animal availability and the ability to hunt and fish are closely linked with environmental conditions (Kielsen-Holm, 2010). This type of research can facilitate knowledge exchange between local experts and scientists, as well as identify adaptive strategies developed and used by northern peoples during times of change.

8.4 CONTAMINANTS AND TRADITIONAL/COUNTRY FOOD

The presence of contaminants in traditional/country food sources presents a direct concern for Aboriginal people, for whom the harvest and consumption of wild food are essential to their cultural identity as well as to their nutrition and health, wellness, and economic livelihoods (Donaldson *et al.*, 2010). Northern Aboriginal peoples and scientists have monitored the presence of contaminants in the Arctic food web and the threat these contaminants pose to human and environmental well-being for over 30 years. Environmental contaminants are substances accidentally or deliberately introduced into the environment that have the potential to harm people, wildlife, and plants. A wide spectrum of substances — persistent organic pollutants (POPs) including organochlorines such as lindane, chlordane, toxaphene, dichlorodiphenyltrichloroethane (DDT), and polychlorinated biphenyl (PCBs), heavy metals (e.g. mercury and lead), and radionuclides — have been found in unexpectedly high levels in the Arctic ecosystem (Muir *et al.*, 1992; Lockhart *et al.*, 1992).

Numerous studies supported by AANDC's Northern Contaminants Program have documented that many species of plants, fish, birds, and mammals carry elevated levels of POPs, raising concern for the health of Inuit, who are most at risk, and of others living in the Arctic who depend on these species for food (Thomas *et al.*, 1992; Chan *et al.*, 1995; Van Oostdam *et al.*, 2005). Elevated levels of contaminants in northern traditional/country food species are linked to the biophysical characteristics of the northern ecosystem and the physical/chemical

properties of the contaminant. Most of these contaminants travel to the North via long-range atmospheric currents and through water systems. Airborne contaminants are deposited onto the Arctic land mass and find their way into the water column, soil, and sediments. They are absorbed (bioconcentrated) by organisms at the lowest trophic levels in the Arctic ecosystem (such as algae and plankton) and begin to bioaccumulate in animals that consume these low-trophic-level organisms. At each higher trophic level (i.e., level in the food chain), the contaminants reach higher concentrations in the tissues of the organisms in a process known as biomagnification (Van Oostdam *et al.*, 2005). These contaminants biomagnify in the fatty tissues of large top of the food chain species such as whale, seal, polar bear, and walrus (AMAP, 2003) to concentrations more than a million times higher than those found in aqueous media. When humans consume these top of the food chain animals, they are exposed to the accumulated levels of all the contaminants stored in the animal tissues (Van Oostdam *et al.*, 2005).

Dietary exposure to contaminants by the mother can result in subtle adverse health effects for the fetus and infant as some contaminants found in traditional/country food species pass through the placental barrier. For example, prenatal PCB exposure and/or mercury can have negative effects on infant development, including impaired cognitive functions and changes in immune system function. Increased exposure to mercury also represents a potential risk factor in cardiovascular disease among adults (AMAP, 2003a; Després *et al.*, 2005; Van Oostdam *et al.,* 2009). Children's exposure to contaminants through breast milk has been a focus of significant investigation through northern dietary studies and human health cohort studies to understand the risk and benefits of consuming traditional/country food to both mothers and infants. Currently it is clear that the benefits of a healthy and nutritious traditional/country food diet outweigh the risks from contaminant exposure (Van Oostdam *et al.,* 2005).

Traditional/country food species, and marine mammal fat and organs in particular, have been cited as the most significant sources of exposure to environmental contaminants such as polychlorinated biphenyls, mercury, and lead for northern residents (Van Oostdam *et al.,* 2005; Laird *et al.,* 2013a). Levels of exposure to mercury and other contaminants among some segments of the population in Nunavik and Nunavut exceed Canadian and international safety guidelines and advisories (Van Oostdam *et al.,* 2005; Chan *et. al.,* 1995; Kuhnlein *et al.,* 1995; Tian *et al.,* 2011). Inuit who consume marine mammals have blood mercury levels that are three to ten times as high as among populations that consume imported food, rates that often exceed blood guidelines (AMAP, 2003a, 2009a). In the Nunavut Inuit Children's Health Survey, nearly 25% of children aged three to five had hair mercury concentrations equal to or higher than the WHO reference level of 2 µg/g (Tian *et al.,* 2011). A comprehensive

risk-benefit assessment considering mercury in the context of omega fatty acids and selenium was conducted and the Government of Nunavut issued an advisory to women of child bearing age to limit their consumption of ringed seal liver to lower mercury exposure (Laird *et al.,* 2013b).

The authors of the third *Canadian Arctic Contaminants Assessment Report* (CACAR)[33] found that when they compared Inuit, Dene/Métis, and non-Aboriginal people, the Inuit (who tend to live the farthest north of all groups and consume the most marine mammals) have the highest levels of almost all POPs and metals (Van Oostdam, 2009).

Donaldson and colleagues (2010) note a positive trend: the proportion of mothers exceeding Health Canada contaminant guidelines has decreased since the CACAR in 2003. Further, a 2009 AMAP report found that levels of "legacy POPs"[34] (e.g., PCBs, dichlorodiphenyldichloroethylene (DDE), and oxychlordane) in human tissues are declining in many regions across the circumpolar zone (AMAP, 2009a).

As illustrated in a 2011 AMAP report on the effects of pollutants and climate change in the Arctic, a clear link exists between contaminants and climate change (AMAP, 2011). Temperature, precipitation rates, wind patterns, water systems, and ice and snow coverage influence the transport pathways of contaminants such as POPs, metals, and radionuclides. In turn, these factors are influenced by climate variability and global change processes (AMAP, 2011). For metals such as lead, cadmium, and zinc, the Arctic is likely to become a more effective trap because precipitation is likely to increase (Macdonald *et al.*, 2000; 2003; AMAP, 2003b; Wrona *et al.* in ACIA, 2005). According to climate change projections for the North Atlantic over the current century, air temperature is expected to increase by 0.4 to 1.0°C, resulting in increased rates of mercury methylation and a potential increase in mercury levels in subsistence food species (Booth & Zeller, 2005; Stern *et al.*, 2012; Krabbenhoft & Sunderland, 2013). Aquatic predators at the top of the food chain, migratory species, and species dependent on ice may be particularly at risk for increased contaminant exposure. These increases could have implications for human exposure via consumption of some fish and marine mammals in these regions (Kraemer *et al.,* 2005).

Environmental change may impact the amount of contaminant deposition and exposure in Arctic ecosystems. Tracking the levels of environmental contaminants in populations over time allows long-term assessments of changes in exposure to contaminants (Donaldson *et al.*, 2010). A more complex challenge is identifying

33 Conducted under AANDC's Northern Contaminants Program in association with the circumpolar AMAP under the Arctic Council.

34 "Old" POPs are covered by agreements that control new emissions. Environmental pollution by these substances is largely a legacy of past practices (AMAP, 2002).

and acting on the interactions among contaminants, nutrition, and lifestyle, along with their cumulative effects on health and cultural well-being (Furgal, 2008). The majority of environmental contaminant issues impacting food quality are related to long-range atmospheric transport and deposition of contaminants from more southern to more northern regions. However, local sources do exist in the form of mineral extraction developments, hydroelectric dams, and abandoned industrial and military sites. The relationships between mining developments and traditional/country food access are complex, as discussed briefly in Section 8.2 (NAHO, 2008c). Reiterating the findings from CACAR reports (Donaldson *et al.*, 2010), the Panel agreed that continued monitoring and research are required to assess trends and health effects of changing diets and emerging contaminants in the Canadian North. Box 8.3 outlines the importance of global approaches to contaminant reduction.

Box 8.3
A Global Approach to Reducing Contaminants

Three international agreements address the issue of contaminants in northern latitudes: the *Stockholm Convention on Persistent Organic Pollutants (POPs)*, the UN Economic Commission for Europe's *Convention on Long-Range Transboundary Air Pollution*, and the UN Environment Programme's *Minamata Convention on Mercury*.

These international instruments reflect Arctic science; socio-political concerns voiced by northern residents (e.g., Inuit are represented at annual Stockholm Convention meetings through the Inuit Circumpolar Council); and the collective and individual efforts of the eight Arctic states, including Canada (see Environment Canada's 2006 *National Implementation Plan under the Stockholm Convention on Persistent Organic Pollutants**). Through the leadership of Sheila Watt-Cloutier, then Chair of ICC and the Canadian Arctic Indigenous Peoples Against POPs (CAIPAP), the human dimension of POPs was brought to the negotiations as a powerful moral reminder of the human cost of environmental contaminants (Downie & Fenge, 2003). With the emergence of the new POPs, however, it is increasingly difficult to keep up with the changing threat of contamination. Several thousand different chemicals are being continuously released into the environment, and determining which ones are of particular concern and need to be monitored is a difficult task. Challenges include developing new methods to reliably measure the new chemicals and evaluating which chemicals need to be scanned for. Considering the long-range transport of POPs, protecting citizens and the environment from them must be a global effort.

* See https://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=769b77f9-

8.5 EMERGING DISEASES AFFECTING WILDLIFE

Davidson *et al.* (2011) point out that because northern regions have low wildlife and parasite diversity, environmental change in this vulnerable environment can lead to changing migration patterns, increased competition for food, and sometimes the introduction of new pathogens. Kutz *et al.* (2004) describe the role played by a combination of climate warming, shrinking habitats, and changes in other ecological factors in the emergence of three nematode species (roundworm parasites) in muskoxen in the central and western Arctic. An increase in parasites in caribou has been reported in the central and eastern Arctic in recent years, and local hunters have expressed concerns about the safety of consuming this meat (Nickels *et al.*, 2005). Similarly, the over-wintering survival and the distribution of some insect species are increased by warming temperatures, which creates opportunities for the introduction of new diseases into Arctic regions or increased risk from endemic pathogens (Parkinson & Butler, 2005).

At least 14 of 27 identified pathogens that cause disease in Canada's wild vertebrates fit the definition of "emerging diseases" (Leighton, 2011). As a result of environmental change, the occurrence and frequency of wildlife disease, including zoonoses, are likely to continue to change and potentially intensify in the future (Leighton, 2011).

A zoonosis is an infectious disease that can be transmitted from animals to humans. Zoonoses are of particular relevance to this discussion, considering the close relationship between humans and wildlife in northern Canada (Owens *et al.*, 2012) and the associated implications for food security. Some northern regions have reported significant cases of zoonotic diseases in humans in the past (Proulx *et al.*, 2002), with a number of zoonotic diseases reported in northern host species, including the following: tularemia in muskrat, beaver, and rabbits; rabies in foxes (Dietrich, 1981); brucellosis in ungulates, foxes, and bears; echinococcosis in rodents or canine species (Chin, 2000); trichinosis in walrus and polar bears; and cryptosporidiosis in both marine (ringed seals) and terrestrial mammals (Proulx *et al.*, 2002). In the NWT, two of the most common agents of food-borne diseases are *Salmonella* and *Campylobacter,* which are commonly presented in unpasteurized or undercooked food (Furgal, 2008). The number of reported incidences has declined in recent years (Pardhan-Ali *et al.*, 2012) (see Box 8.4). More baseline data about zoonoses and wildlife diseases are required (Owens *et al.*, 2012).

8.6 ADAPTATION TO ENVIRONMENTAL CHANGE

While several damaging effects of environmental change have already been documented and continue to occur, it should not be assumed that all changes will be negative. For example, the appearance of new species moving north as a result of climate warming may represent the introduction of new subsistence species, as is being observed with moose in Labrador and Nunatsiavut most recently. As well, the agency of northern peoples must not be discounted. As Duerden (2004) explains, "the North's Indigenous populations are certainly not neophytes in dealing with climate-generated stress" (see Box 8.5).

Box 8.4
A Promising Practice: Walrus-Testing Program at the Nunavik Research Centre

Walrus are traditionally harvested for food in northern coastal communities, including about half of the communities in Nunavik (Larrat *et al.*, 2012). Meat is frequently eaten raw or fermented (Proulx *et al.*, 2002), but the consumption of undercooked meat represents a zoonotic hazard (Larrat *et al.*, 2012). During the 1980s and 1990s, outbreaks of the potentially fatal trichinellosis caused by the consumption of trichinella-infected walrus meat led Inuit communities in Nunavik to develop a program that tests walrus meat for the disease-causing zoonotic parasite (Proulx *et al.*, 2002). The Nunavik Trichinellosis Prevention Program (NTPP) is a regionally based screening program for disease prevention that began in 1992 in Salluit and was then expanded to other walrus-harvesting communities in 1996 (Larrat *et al.*, 2012). Hunters participate in the program on a voluntary basis and, with the assistance of local HTAs or health centres, ship samples to the Nunavik Research Centre (NRC) in Kuujjuaq, Quebec (GN, 2011; Larrat *et al.*, 2012). Once the NRC receives the sample, results are generally processed and communicated within 24 hours (Larrat *et al.*, 2012).

Based on the absence of recent cases of trichinellosis from walrus meat, the program's economic feasibility, and the positive implications it has demonstrated on the continuation of the hunt, Larrat *et al.* (2012) conclude that the NTPP could be used as "a model for a successful health-related prevention program in the Arctic." Two new laboratories, in Nain, Nunatsiavut, and Yellowknife, NWT, have also been created and equipped with basic testing equipment (Owens *et al.*, 2012). Larrat and colleagues attribute the NTPP's success to the nature of the disease and its origin, the existence of an efficient method to analyze results, inter-sectoral partnerships and local participation, and a "science-to-action" approach.

Box 8.5
Resilience and Adaptability as Responses to Climate Change

"The change is so gradual that we adapt without even noticing, our ability to adapt kind of makes it easier, we change without even knowing, we do what we have to do."

— Deh Gah Got'ie Dene First Nation community member on adapting to environmental changes and access to traditional food (Guyot *et al.*, 2006)

Further work is required to investigate the complex ways that relevant variables (e.g., cultural history, local conditions, attitudes, economic relationships) interact and condition community responses to climate change (Duerden, 2004). However, evidence indicates that, in some cases, climate change may open avenues to previously unattainable possibilities, including new hunting opportunities. For example, hunters on St. Lawrence Island, Alaska have been able to take bowhead whales in late fall due to later freeze-up, helping them counteract some of the climate-related challenges with the more customary spring hunt (Noongwook *et al.*, 2007). Warming temperatures may also increase opportunities for local food production in some regions, alleviating the potential stress of relying on transportation networks connected with the south. Increased summer temperatures and growing periods in regions such as the western Arctic may enhance opportunities for small-scale northern agriculture; this may provide additional and potentially more cost-efficient, local sources of food. Mills (2001), for example, identified significant areas (39 to 57 million hectares) of potentially viable land for northern agriculture in the western Arctic under future climate scenarios. Similarly, as acknowledged in Quebec's *Plan Nord* (more recently known as *Le Nord pour tous*), Northern Quebec has 1.5 million hectares of arable land. Quebec's 2011–2016 action plan includes several priority initiatives for the bio-food sector, including a bio-food research network[35] north of the 49th parallel, the construction of greenhouses in the North, the expansion of a development strategy for non-timber forest products, a sustainable development strategy for small northern fruits, and the development of a joint strategy to promote local projects outside the regions covered (Government of Québec, 2011). The *Plan Nunavik* also lists a number of bio-food production pilot projects, including community greenhouses and the domestication of caribou, muskox, and ptarmigan (KRG, 2012). AANDC's Climate Change Adaptation Program supports Aboriginal and northern

35 The network facilitates the exchange of information on bio-food technologies and developments among the municipalité de la Baie James, the Cree Regional Authority, and the Kativik Regional Government (KRG, 2012).

communities in their efforts "to address risks and challenges posed by climate change impacts and to become more resilient" through partnerships that enable communities to plan for, and adapt to, climate change (AANDC, 2012a).

8.7 CONCLUSIONS

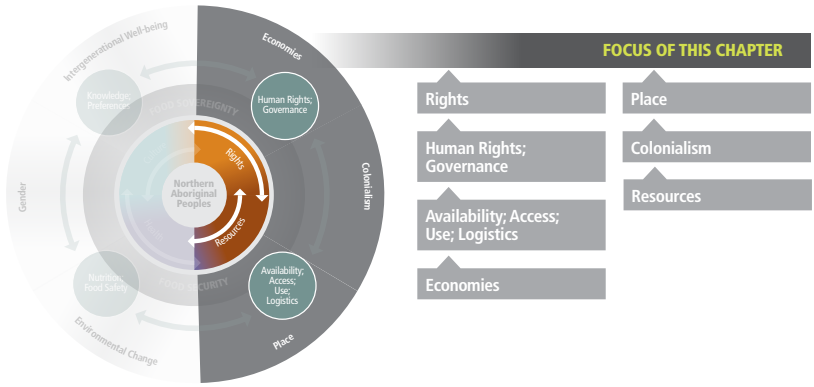
Food safety, cultural continuity, mobility and the ability to hunt safely, as well as access to nutritious food and traditional knowledge exchange are but a few ways environmental change impacts food security. Changing environmental conditions affect habitat and sustainability of species; important populations of traditional/country food species in northern Canada are changing in quantity and quality due to environmental and anthropogenic forces. Environmental conditions have also transformed the places and practices wherein traditional knowledge about food, land, and wildlife has been adapted and transmitted. Land use changes from resource exploration and development activities impact northern Aboriginal peoples' traditional/country food security, food sovereignty, health, and wellness, and must be better understood. Contaminants are still found in northern ecosystems, although the benefits of a healthy and nutritious traditional/country food diet continue to outweigh the risks of food-based contaminant exposure. All these changes are of cultural and health-related significance for northern Aboriginal peoples.

9

Northern Governance and Food Security

- The Right to Food and Food Sovereignty
- Circumpolar Arctic Governance
- Governance in Northern Canada
- Conclusions

9 Northern Governance and Food Security



Key Findings

Aboriginal people's access to land and resources is a critical component in food sovereignty and food security strategies in northern Canada. Indigenous control or influence over these matters at an institutional level currently arises most commonly through constitutionally protected harvesting rights, as well as through comprehensive claims (also known as *modern treaties* or land claims), which may address harvesting quotas and wildlife co-management strategies.

Consideration of food sovereignty helps to illustrate how rights and responsibilities have shifted over time in the North. A variety of rights and benefits that impact food access and food security are encompassed in land claims agreements, ranging from representation from organizations that supervise land, water, and wildlife management issues or evaluate the effects of development, to responsibilities related to public infrastructure asset management.

Traditional knowledge and community-based monitoring of food, land, and wildlife are critical to inform government, industry, and researchers about the environmental and human impacts upon wildlife.

The federal government uses income support and food subsidy programs to offset the high costs of living in the North. These programs may have impacts on individual and household-level food security by liberating financial resources.

Building on the factors outlined in earlier chapters that have direct connections to food security in northern Canada, this chapter explores factors that have more complex relationships with food security, food sovereignty, and northern Aboriginal peoples. Traditional food security depends on the protected right to access lands, the right to harvest, and intact relationships between community, land, and harvest. These rights and relationships are shaped and constrained by past and present governance. Chapter 9 explores the effects of changing systems of governance and the resulting extent to which northern Aboriginal peoples are able to achieve food security and food sovereignty. It focuses on human rights and governance at multiple levels of jurisdiction, and it explores how these factors interact with food access and use.

9.1 THE RIGHT TO FOOD AND FOOD SOVEREIGNTY

With attention to the intersecting realities of the legacy of colonialism, environmental dispossession, and Aboriginal well-being, MacIntosh (2012) points out how law and policy have affected, and continue to affect, the lives of all Indigenous peoples. Various institutional structures, including governance regimes, shape the lived realities of northern Aboriginal peoples in ways that impact upon their autonomy and ability to create and access conditions that would enable better health, including access to traditional lands and traditional food systems and sources (MacIntosh, 2012). An example of this can be seen in the EU ban on seal products, which many argue has had a negative impact on the livelihoods of Aboriginal peoples by depriving those who relied on the sale of these products of the ability to fund traditional hunting activities.

Instruments such as the UNDRIP (UN, 2008) identify international legal norms that are relevant for addressing some aspects of food security. According to these norms, Indigenous peoples have rights to the resources and territories they have traditionally occupied, and the right to own and develop these lands by reason of their traditional ownership or use. States must grant legal recognition to these territories and resources, and should consult and cooperate in good faith with the Indigenous peoples concerned to obtain their free, prior, and informed consent before adopting and implementing legislative or administrative measures that may affect them.[36] This broader context emphasizes the relevance of food sovereignty research in enabling food security in northern Canada.

36 Aboriginal access to land and resources is a critical consideration in food security strategies, cultural activities, and sustainable development, but researchers note that although formal recognition is important, "the security it provides remains relative" (Duhaime & Bernard, 2008).

Consideration of food sovereignty helps to illustrate how rights and responsibilities have shifted over time in the North. It buttresses understandings of food security by focusing on the power relations and politics often absent from definitions of food security (Wittman *et al.*, 2010). As illustrated later in this chapter, factors such as wildlife co-management strategies, harvesting rights, and cross-border trade of animal products, as well as the commoditization of traditional/country food discussed in Chapter 5, appear to represent important considerations in strategies to promote food sovereignty and food security (further discussion is found primarily in Section 9.3.1, which discusses the impact of land claims settlements on food sovereignty).

9.2 CIRCUMPOLAR ARCTIC GOVERNANCE

In the worldwide context, large-scale forces (such as long-range transport of contaminants and global economic trends) are acting upon the Arctic's environment and peoples. In addition, the Arctic is important as a result of the ecosystem services it provides globally, the cultural and biological richness, and the existence — and therefore potential for exploitation — of a vast range of natural resources. All of these act as forces on food security and influence the livelihoods of Aboriginal peoples. Food security can be envisioned as an aspect of human security. Human security, while tied to the absence of military threat, also recognizes the value of economic development, human rights, law, good governance, sustainable development, and social equity in achieving lasting stability. As Exner-Pirot (2012) explains, human security has been a catalyst for policy-making in the circumpolar region, especially in terms of environmental and cultural security.

In addition to the international agreements between nation-states, governance has also been achieved by cooperation between Aboriginal peoples in Canada and their counterparts in other countries. For example, the *Polar Bear Management Agreement in the Southern Beaufort Sea* was signed in 1988 by representatives of the Inuvialuit Game Council in the NWT and the North Slope Fish and Game Management Committee in northern Alaska (Huntington, 1992). This was as a result of shared concern over the polar bear that both groups felt was better addressed by groups of hunters than through national governments. The success of this arrangement led to further cooperation in the research and management of beluga whales and other species that move across the Canada–United States border in the Beaufort Sea.

The Arctic Council, established in 1996, is a high-level, consensus-based forum to "provide a means for promoting cooperation, coordination and interaction among the Arctic States" (Arctic Council, 2011).[37] The eight Arctic nations (Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and United States) form the core of this high-level forum. Six Indigenous organizations, including the Arctic Athabaskan Council, Aleut International Association, Gwich'in Council International, Inuit Circumpolar Council, Russian Arctic Indigenous Peoples of the North, and Saami Council, are involved as permanent participants, and several non-Arctic nations and international organizations are observers (Arctic Council, 2011). Arctic Indigenous communities and other Arctic inhabitants participate in decision-making on common Arctic issues such as the EU ban on seal products, sustainable development, and environmental protection (Arctic Council, 1996).

The rapid changes in the Arctic environment and increased opportunities for exploitation of the region's resources inspire challenging decisions for the nations themselves, cooperative bodies such as the Arctic Council, and the broader global community. The international community is keen to, at different times, both exploit those resources and economic opportunities and protect the region's environment.

9.3 GOVERNANCE IN NORTHERN CANADA

Of central importance to food security and health are the roles and responsibilities of actors at multiple levels of jurisdiction across northern Canadian communities. Laws and governance issues fall under federal, provincial, territorial, municipal, and Indigenous jurisdiction. Indigenous jurisdiction may arise through rights recognized under the Canadian Constitution, and may also be recognized through land claims and self-government agreements. These latter instruments may regularize co-management regimes among multiple levels of government and thus link Aboriginal governments with territorial or federal ones. The status of land claims and self-government agreements varies across Canada, with dozens of ongoing negotiations south of the 60th parallel yet to be settled. International agreements and organizations may also be relevant for law and governance issues in the Canadian North.

Aboriginal self-government can be broadly defined to include "structures and organizations which increase the influence of Aboriginal Peoples in decision-making about matters that affect their lives" (Peters, 2002). Self-determination embodies the right for all peoples to determine their own economic, social,

37 The *Ottawa Declaration* specifically notes that "the Arctic Council should not deal with matters related to military security" (Article 1a).

and cultural development. Self-determination has thus been defined by the International Court of Justice (in the 1975 Western Sahara case) as "the need to pay regard to the freely expressed will of peoples" (ICJ, 2013). Examples range from participation on regional advisory boards to legal agreements that formally acknowledge that Aboriginal communities or collectives have jurisdiction over policy areas specific to them (Peters, 2002).

Both historic and contemporary treaties exist in Canada. Historic, numbered treaties are in place across Alberta, Saskatchewan, Manitoba, Ontario, and parts of Yukon, Northwest Territories, and British Columbia (AANDC, 2010b). These instruments may address issues of Aboriginal governance, land, and resource rights, but in all cases need to be interpreted to be meaningful in the modern context under which Aboriginal peoples have constitutional protection, and any potential clashes with existing provincial and federal regimes must be addressed. The first contemporary treaty, *James Bay and Northern Quebec Agreement*, was settled in 1975 and was explicitly intended to address governance and resource management issues (Government of Québec, 1998). Twenty-six self-government and comprehensive land claims agreements and two stand-alone sectoral self-government agreements have been settled since 1973 (AANDC, 2013b). These contemporary agreements have vastly increased certainty over governance issues in certain areas, but questions of interpretation appear to remain contentious in some instances. As well, the governance of vast areas of territory, particularly in British Columbia, Quebec, and the Maritimes, remains unsettled and contested. Comprehensive land claims agreements intended to enable Aboriginal peoples to manage and co-manage their lands and resources are in place throughout much of Canada's northern territories, including the following:

- the 1975 *James Bay and Northern Quebec Agreement* between the Cree and Inuit of northern Quebec;
- the *Inuvialuit Final Agreement*, which was signed in 1984, and was the first comprehensive land claims agreement settled in the NWT;
- the *Gwich'in Comprehensive Land Claim Agreement*, which was signed in 1992;
- the *Sahtu Land Claim Agreement*, which was ratified in 1993;
- the *Yukon Umbrella Final Agreement*, which was signed in 1993;
- the *Nunavut Land Claims Agreement*, which led to the creation of Nunavut in 1999 and represents the largest Aboriginal land claims settlement in Canadian history;
- the 2005 *Labrador Inuit Land Claims Agreement*, the first of its kind to be finalized in Atlantic Canada, and which provides Inuit in Nunatsiavut with defined self-governance, rights, and land; and

- the *Nunavik Land Claims Agreement* in Quebec, signed in 2006, and the 2007 *Inuit of Nunavik Agreement in Principle*, providing for the consolidation of the three institutions created under the *James Bay and Northern Quebec Agreement* into a new Nunavik regional government body.

A key aspect of these new comprehensive agreements is the way in which they spell out fisheries and wildlife management. In addition, these agreements articulate the relationship between the Government of Canada and Aboriginal peoples by clearly outlining rights such as management of land and resources and land use regulations, all of which impact food security and food sovereignty (Berkes *et al.*, 2005).

9.3.1 The Right to Harvest and Wildlife Co-Management Strategies: Treaties and Co-Management Regimes under Land Claims Agreements

As part of realizing a form of self-government, Indigenous communities and organizations (both globally as well as in Canada) seek management, access, and ownership rights over natural resources in their traditional territories. Access to animal and plant resources has particular relevance for achieving food sovereignty and food security in northern Canada. Indigenous control or influence over these matters at an institutional level currently arises most commonly through constitutionally protected harvesting rights, as well as through comprehensive claims (also known as *modern treaties* or *land claims*), which may address harvesting quotas and wildlife co-management strategies. These rights to harvest are closely managed and controlled. Harvest rights are not unlimited, and sustainable population management, informed through science and traditional knowledge, establishes quotas and management plans if needed (see Box 9.1).

Aboriginal self-government can include environmental co-management strategies, under which traditional knowledge systems must be drawn upon as sources of information. This is required, for example, by the JBNQA (1975), the *Yukon Umbrella Final Agreement* (YUFA) (1993), and the *Nunavut Land Claims Agreement* (NLCA) (1993).[38] Questions have been raised about whether the state has met its obligations under these agreements, especially the JBNQA (Dalton, 2006;

38 While each agreement provides for a land use planning agency (the YUFA and the NLCA also provide for separate water advisory boards) as well as environmental screening and impact review processes, only the JBNQA and the NLCA provide for harvester support programs, and none of the Agreements specifically attend to the commercial marketing and production of country food (Peters, 2002).

Box 9.1
Crees and Trees

Aboriginal peoples in Canada present a special case of citizen involvement in forest governance, with rights and status that go beyond those of other stakeholders and individuals. As a result, processes aimed specifically at increasing Aboriginal representation are being used to encourage collaboration in forest management, to various extents. There have been several successes, but conflicts also occur (Wyatt, 2008).

According to the Cree, preserving the integrity of the boreal forest environment is imperative not only for the economic needs of their people, but also for the survival of their culture. It is not just a question of too many trees being cut by the forest industry but rather an issue of cultural survival and fundamental human rights. Since the mid-1970s, cutting in the Cree territory of *Eeyou Astchee* has increased dramatically. Existing forestry practices are having an impact on the Cree hunting territories. The JBNQA includes the acceptance and recognition of the Cree right to hunt, fish, and trap in their traditional lands. According to the treaty, all future development in *Eeyou Astchee* is to occur in a manner that protects the Cree ability to continue to live from the land. The treaty promises protection for the family hunting territory system of land use. Nevertheless, current forestry practices under the JBNQA enable logging companies to plan logging operations without consideration of Cree use of the land, through the system of land administration. In some cases this has allowed logging companies to deplete up to 80% of a hunting territory in as little as 20 years while still falling within provincially set cutting levels for that particular management unit (Grand Council of the Crees, n.d.).

Mainville, 2007); and, in particular, whether the co-management regime that has been developed reflects the expectations of the Cree and provides them meaningful participatory rights (MacIntosh, 2010).

There are many examples of efforts at local, national, and international levels to promote adaptive and collaborative natural resource management. For example, guided by *Inuit Qaujimajatuqangit* and scientific knowledge, the Nunavut Wildlife Management Board (1994) was established to "conserve wildlife (and wildlife habitat) for the long-term benefit of all Nunavut residents

while fully respecting Inuit harvesting rights and priorities" (NWMB, n.d.). The Manitoba Métis Federation's *Métis Laws of the Harvest* (MMF, 2012) gives clarity and promotes Métis-specific discussion on their harvest rules. The *National Biodiversity Strategy*, the *National Forestry Strategy*, the *National Parks Act*, and the *Inuit Impact and Benefit Agreement for Territorial Parks* represent other national co-management agreements documented by NAHO. The *International Joint Commission Boundary Waters Treaty*, the *Agreement on the Conservation of Polar Bears*, and the *North American Bird Conservation Initiative* are examples of international strategies that recognize the importance of traditional knowledge for the purposes of wildlife management and conservation (Crowshoe, 2005).

The link between food sovereignty, food security, and co-management strategies includes not only the health of wildlife and its environments, but also the ability of northern peoples to access these resources and be partners in conservation efforts. Evidence indicates that it is essential to develop resource co-management strategies as part of an iterative process to enable constructive dialogue between northern peoples, scientists, and wildlife managers to promote conservation and build a governance system that promotes trust and allows for problem-solving among participants (Carlsson & Berkes, 2005; Natcher *et al.,* 2005; Dowsley & Wenzel, 2008).

9.3.2 Specific Harvest Rights

The majority of hunters across Canada's territories are Aboriginal peoples whose hunting rights are protected under Canada's Constitution or set out in land claims settlements (i.e., modern treaties). The other two main groups of hunters in northern Canada are non-Aboriginal resident hunters and commercial (non-resident) hunters. Each of these three groups has different rights (Gunn *et al.*, 2011). In Nunavut, for example, Article 5 of the 1993 *Nunavut Land Claims Agreement* (DIAND & the Tunngavik, 1993) sets out a harvesting rights regime based on the principles that Inuit are traditional and current users of wildlife and that their legal rights to harvest wildlife stem from their traditional and current uses. It also acknowledges that there is a need for an effective system of wildlife management that complements Inuit harvesting rights and priorities and recognizes Inuit systems of wildlife management that contribute to the conservation of wildlife and protection of wildlife habitat (see Box 9.2). The Agreement seeks to create a wildlife management system governed by the principles of conservation, while acknowledging and reflecting the role of Inuit in wildlife harvesting (DIAND & the Tunngavik, 1993).

Box 9.2
Hudson Bay Beluga Quota

Inuit hunt beluga in Ungava Bay and the Hudson Strait as a critical subsistence species. Harvest quotas have existed since 1986 and are revised periodically. The 2013 Hudson Strait beluga hunting season opened March 20 to August 31, 2013, or until the quota of 190 animals was reached. Fisheries and Oceans Canada, in its *Harvest Advice for Nunavik Beluga* (CSAS, 2013), suggests that the Eastern Hudson Bay stock "is straddling the limits of Nunavut and Nunavik" and that changes in harvesting practices could have "an important impact" on the belugas there. An example of such a change occurred in the winter of 2012–2013, when there was a cull of 70 animals trapped in ice near Sanikiluaq. DFO estimated that removing 49 belugas from the Eastern Hudson Bay stock would have a 50% probability of causing a decline in the stock, which is considered endangered by COSEWIC. A 2008 survey had determined that the number of belugas in the Eastern Hudson Bay already had dropped from 4,300 belugas in 1985 to 3,000 in 2008. According to DFO, as of 2011 the stock size had remained at about 3,000 belugas, compared with an average of 4,200 over the period 1983–2008.

With the settlement of the *Labrador Inuit Land Claims Agreement* (S.C.C., 2005), the Inuit of Nunatsiavut secured clearly defined rights to a 72,500-square-kilometre land base and a 48,690-square-kilometre coastal zone. Within the settlement region, Inuit residents have the right to harvest wildlife resources to meet their domestic needs or their Inuit Domestic Harvest Limits (IDHLs). *Domestic need* is defined as the amount of resources necessary to satisfy individual, non-commercial use and fulfil social and ceremonial purposes. Levels of domestic need are based on historical harvesting levels derived from available data (i.e., harvest studies). The use of domestic harvest levels as a basis for wildlife harvesting policy was promoted by the federal and provincial governments for their ability to set clearly defined harvest limits and facilitate effective monitoring and enforcement capabilities. Since its settlement, the Nunatsiavut Government has implemented an ongoing community harvest study establishing IDHLs for 138 different species and resources used by Inuit residing in the Nunatsiavut Settlement Region.

An exploration of Aboriginal hunting rights in the context of the Yukon North Slope (the Beaufort Sea watershed) is also informative in this regard. The *Inuvialuit Final Agreement* outlines management arrangements to protect and conserve wildlife populations, the environment, and traditional Inuvialuit use of the land (WMAC, 2008). Currently under this agreement, grizzly bears, polar

bears, and bowhead whales are under a quota system, where distribution of the harvest between different groups of harvesters (i.e., Inuvialuit and non-Inuvialuit) and/or different uses, communities, regions, and seasons are determined. In some cases, Inuvialuit have exclusive rights to hunt animals, and, in other cases, preferential rights.[39] Hunters must report harvests of animals governed by these harvest quotas. Harvesting information is also collected using hunter recall surveys (WMAC, 2008).

9.3.3 Canadian Social Programs and Food Security

The state, at various levels, provides social programs to support the well-being of northern Aboriginal peoples. Income support programs are the primary vehicle by which the federal government delivers assistance to diminish some of the costs of living across Canada, including in the North. As an extension, these programs may have indirect impacts on individual and household-level food security by liberating financial resources. Examples include Employment Insurance, Old Age Security and the Guaranteed Income Supplement, the Canada child tax benefit, northern tax benefits, the Income Support Program (for Aboriginal people living on-reserve), and money to support housing programs. Other social support programs, including those surrounding daycare and child care, can positively impact food security. Gagné *et al.* (2012) reported that children who attended child-care centres in Nunavik between 2006 and 2010 had significantly higher intakes of omega-3 fatty acids, calcium, total iron, bioavailable iron, phosphorus, beta-carotene, folate, pantothenic acid, riboflavin, and vitamin K on the day of the dietary recall. The proportion of children meeting the recommended servings for vegetables and fruit, grain products, and milk and alternatives was also significantly higher among participants who attended a child-care centre.

The economic costs associated with chronic diseases due in part to changing food consumption patterns must also be considered. The rise in such conditions, the associated health and wellness impacts on individuals, families, and communities, and the economic costs of health delivery to treat these conditions are important considerations. Programs such as the Aboriginal Diabetes Initiative (ADI) have been introduced to help reduce type 2 diabetes among Aboriginal people through support of health promotion and primary prevention activities and services delivered by trained community diabetes workers and health service providers (Health Canada, 2013). “Renewed funding has enabled more than 600 First Nations and Inuit communities throughout Canada to continue to build on past successes. Using local knowledge, First Nations and Inuit communities

39 Preferential rights allow Inuvialuit the first opportunity to harvest what they need for food, clothing, and other personal use. Others may also have the right to harvest after Inuvialuit personal and family needs are met.

are encouraged to develop innovative, culturally relevant approaches aimed at increasing community wellness and ultimately reducing the burden of type 2 diabetes. Community activities funded through the ADI vary from one community to another and may include walking clubs, weight-loss groups, diabetes workshops, fitness classes, community kitchens, community gardens, and healthy school food policies. The ADI also supports traditional activities such as traditional food harvesting and preparation, canoeing, drumming, dancing, and traditional games" (Health Canada, 2013).

As a response to the high costs of market food, food subsidy programs have fulfilled an important role in northern communities since the 1960s (SCAAND, 2011). These have come in the form of the federal government's Northern Air Stage Program (delivered by the Canada Post Corporation), the Food Mail Program (FMP) (administered by AANDC, 1999–2011), and Nutrition North Canada (2011–present). The latter two programs will be described in the sections that follow.

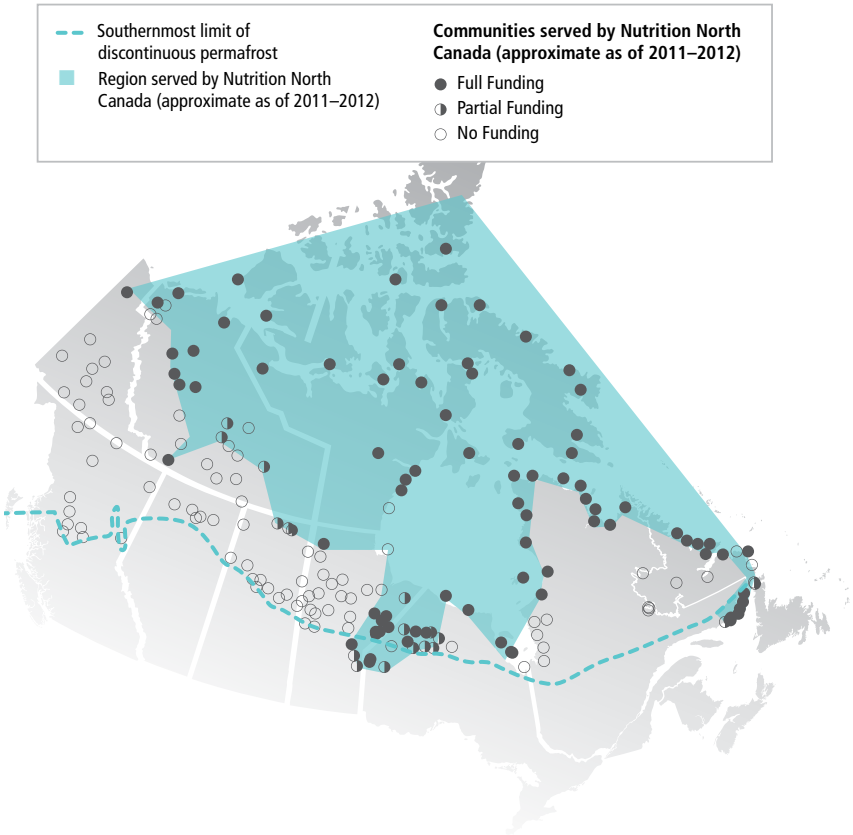
The FMP was intended to promote healthy eating by making nutritious perishable food more affordable and accessible through subsidizing part of the transportation costs (AANDC, 2009). Amid increasing program costs, a major 2006–2009 federal evaluation of the FMP revealed that the program experienced some success in achieving an overall healthy diet for northern Aboriginal peoples. The availability and affordability of nutritious food in remote communities improved, and the FMP reduced prices for the most nutritious perishable food by about 15 to 20% of their non-subsidized costs (SCAAND, 2011). AANDC estimated that about 62% of the subsidy was passed on to consumers in isolated northern communities eligible for the program (SCAAND, 2011). The Panel recognized that food costs are not merely reflective of transportation costs, but also include the significant costs involved with warehousing and distribution in the communities.

Dietary studies, however, indicated that the proportion of mean daily calories from food of little nutritional value and convenience food had generally increased over time (AANDC, 2009; see also Lawn & Harvey, 2003, 2009), and the requirement of a credit card for direct-order purchases limited the accessibility of the program for many northern Aboriginal residents. Shortfalls in the FMP were largely attributed to limited program knowledge, limited program transparency, limited program reach and food eligibility, food quality issues, the claims process, logistics, the continuing high cost of food, the changing diets of northern Aboriginal peoples, and the level of cultural appropriateness (AANDC, 2009; SCAAND, 2011). As a result, recommendations for future programming have included the incorporation of traditional/country food, the

provision of a replacement subsidy for traditional/country food production, the removal of constraints related to the mode of transportation for food under subsidy, the establishment of marine transport and warehousing subsidies, the lowering of the airfreight subsidy to provide greater flexibility and support for accessing cheaper modes of shipment, and community restocking. In addition, there is support for inter-settlement transport within the territory (BDS, 2011; Ford & Beaumier, 2011), along with an acknowledgement that lack of credit opportunities for many First Nations, Métis, and Inuit may reduce the access to some cheaper food opportunities (e.g., being able to purchase a large quantity of food by sea lift in the Arctic coastal communities).

In response to the issues with the FMP and in recognition that the eligible food list had grown to include items with questionable nutritious value, Nutrition North Canada was introduced (see Figure 9.1). This program is based on a supplier-focused, market-driven model. It provides funding directly to retailers, suppliers, and country food processors who apply, meet program requirements, and sign funding agreements with AANDC (AANDC, 2012d). These parties are then responsible for passing along savings to consumers (AANDC, 2013d). Nutrition North Canada identifies two levels of subsidies that apply to eligible food and non-food items when they are air-shipped to an eligible community. With an annual budget capped at $60 million (SCAAND, 2011), subsidy rates are intended to reflect the perishability and nutritional value of the food product (AANDC, 2012e). Non-perishable food and non-food items are expected to be shipped via winter roads, sealift, or barge (AANDC, 2013c). For example, higher subsidy rates apply to perishable food that has been identified as most nutritious. Lower subsidy rates apply to other nutritious perishable food, non-perishable food, and non-food items. Subsidy rates differ among communities, with consideration for retailers' shipping costs, the estimated amounts of eligible products that will be shipped by air to eligible communities, and the number of eligible communities (AANDC, 2013c). These estimated amounts are revised periodically by food retailers and suppliers because Northerners' demand for eligible products changes over time. Subsidy rates may need to be adjusted when the estimated amounts are revised (SCAAND, 2011; AANDC, 2012d, 2013c).

Suggestions to integrate traditional/country food in a variety of ways into the new Nutrition North Canada regime (see Myers *et al.*, 2004) have been adopted to some degree (AANDC, 2012e). The Panel reflected on the effectiveness of the changes and asked what potential they have to address the issues related to food access and consumption behaviour. Clearly, this remains to be seen, and the Panel suggested it would require ongoing monitoring and evaluation. Nutrition North Canada has also attracted considerable controversy. Key concerns



Created by: Glenda Smith, Oct 2013
Hydrology and Boundaries: GeoGratis (Atlas of Canada Vector Data)
Southernmost limit of discontinuous permafrost boundary line: Aboriginal Affairs and Northern Development Canada – Northern Scientific Training Program (NSTP)
Nutrition North Data: Indian and Northern Affairs Canada, News Releases, 2011.
Datum – D_North_American_1983; Projection – Canada_Albers_Equal_Area_Conic

Figure 9.1

Map of Nutrition North-Funded Communities (2011–2012)

This figure depicts the diversity of remote northern communities, as listed in the Atlas of Canada database, that are located north of the southernmost limit of discontinuous permafrost (blue dotted line). Only some of these communities fall within the jurisdiction of Nutrition North Canada (those within the shaded area). Some communities receive a full subsidy, while others are eligible for a partial subsidy. Rates depicted are from 2011–2012, coinciding with the beginning of the assessment. The program may affect the extent to which food security may be achieved in each of these communities, but an external review of the program has yet to be completed.

include the program's list of criteria for communities and food items eligible for the subsidy, whether the subsidy is in fact being passed on to consumers, and the extent to which nutritious food has become accessible and available (De Schutter, 2012). These concerns are directly tied to and impact important issues for food security. A full performance audit of the program by Canada's Auditor General is currently underway, and the full findings are expected to be released in 2014 (Weber, 2013). For now, however, the Panel acknowledges the gaps in the effects and efficacy of the current program and points to the important factors, including rights contained in land claims agreements (e.g., harvesting rights), as indicated in the conceptual framework (Figure 2.1), that ideally need to be considered in the development of any new food subsidy program. Further, as processes of devolution continue in the NWT and Nunavut, there is an increasing imperative for local capacity building to address food security and food sovereignty.

9.4 CONCLUSIONS

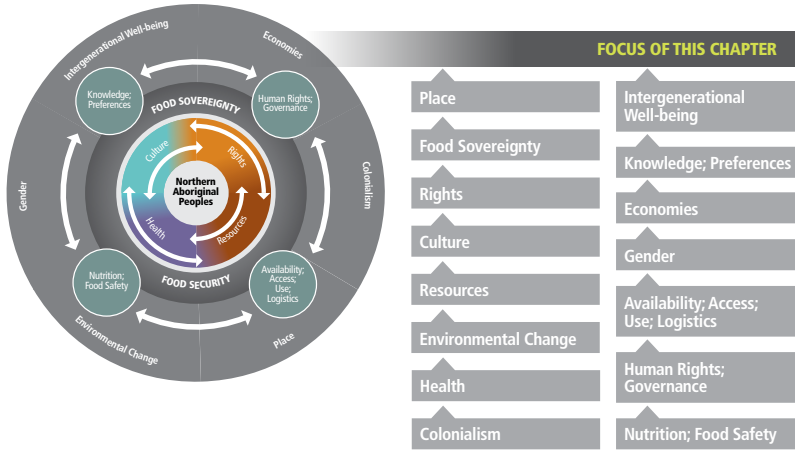
Traditional food security and food sovereignty depend on the protected right to access lands, the right to harvest, and holistic relationships between community, land, and harvest. These rights and relationships are shaped and constrained by past and present governance. At an institutional level, Aboriginal peoples can influence or control these matters through constitutionally protected harvesting rights, as well as through comprehensive claims, which may encompass harvesting quotas and wildlife co-management strategies. Food sovereignty helps to illustrate how rights and responsibilities have shifted over time in the North. Many types of rights and benefits that impact food security and food sovereignty are encompassed in land claims agreements, such as representation on organizations that supervise land, water, and wildlife management issues or evaluate the effects of development, to responsibilities related to public infrastructure asset management. Traditional knowledge and community-based monitoring of food, land, and wildlife are essential practices that provide up-to-date information about environmental health. Additionally, federal income support and food subsidy programs may have impacts on individual and household-level food security by liberating financial resources.

10

Programs and Practices Addressing Northern Food Security and Food Sovereignty: Canadian Efforts, International Approaches

- Canadian Efforts
- International Approaches
- Conclusions

10 Programs and Practices Addressing Northern Food Security and Food Sovereignty: Canadian Efforts, International Approaches



Key Findings

Because food insecurity is experienced differently at individual, household, community, and regional levels, it follows that strategies to mitigate food insecurity must be similarly diverse.

Cultural considerations are important in the development of any strategy to mitigate food insecurity. With this in mind, it is still informative to examine practices to mitigate food insecurity in other circumpolar regions.

Long-term alleviation of food insecurity requires drawing on the assets, talents, and abilities of northern communities. These communities are experiencing the impacts of food insecurity and the related environmental, economic, and social changes in the Canadian North, and they are generating effective solutions.

An array of multilevel approaches based on inter-sectoral collaboration among communities, local agencies, government, businesses, and institutions is important for sustainable initiatives.

Consideration of locally appropriate guidelines and regulatory frameworks for the local sale of traditional/country food, as is done in Greenland, may prove to be another mechanism for the production and distribution of local food.

This chapter brings all the factors of the conceptual framework together by considering promising practices for addressing food insecurity. Responding to sub-questions 3, 4, and 5, the chapter explores Canadian efforts and international approaches to developing evidence and knowledge systems in support of strategies to mitigate food insecurity, and highlights several examples of interventions to build food security and food sovereignty. In so doing, it focuses on the contribution of traditional knowledge networks and resources to promote food security and food sovereignty at multiple levels of jurisdiction.

The Panel underlined the importance of differentiating between programs that mitigate food insecurity in the short term (e.g., food banks, soup kitchens); those that offer medium-term solutions such as education efforts (not only for those living in the North, but also aimed at those who work in the many sectors of government that influence food security), hunter support subsidies, etc.; and long-term solutions such as sustainable efforts to reduce poverty and the development of community-led food production and distribution networks.

10.1 CANADIAN EFFORTS

As explained in Chapter 4, traditional knowledge of the local environment, combined with the related skill sets for harvesting, travelling on the land and water, and food processing, can be understood as a set of cultural practices necessary for food security. The extent to which this knowledge is transmitted to future generations plays an important role in determining the health and wellness of individuals and communities. Traditional knowledge has always guided the lives of northern Aboriginal peoples (Tagalik, 2010), and a growing number of Canadian and international participatory research projects and community-based programs are making valuable contributions to food security research. Findings from these initiatives have been cited as evidence throughout this report. It is clear that they contribute to knowledge sharing that can lead to more holistic understanding of northern food security issues.

Table 10.1 presents a selection of Canadian institutes, organizations, and networks that actively promote the integration of traditional knowledge and participatory approaches in northern food security research. The Panel noted that these channels are important resources for current and future research and policy development related to food security and northern Aboriginal peoples. They also represent models from which other organizations can learn.

In addition, numerous food security networks and organizations exist across Canada at local, municipal, provincial, territorial, and national levels. Traditional knowledge is incorporated into some of the projects they support (e.g., the Food Security Network of Newfoundland & Labrador and the *NiKigijavut Hopedalimi* Project).

Table 10.1

Northern Food Security: A Selection of Canadian Resources

Organization	Approach
Indigenous Knowledge and Food Security	
Northern Food Network (NFN)	Through Food Secure Canada, the NFN supports and connects those who are working towards food security and/or food sovereignty in remote communities or those who are north of the 60th parallel. Website: http://foodsecurecanada.org/webform/northern-food-network
Northern Healthy Foods Initiative (NHFI)	With partners from First Nations organizations, local, provincial, and federal governments, departments, and agencies, the private sector, and NGOs, the NHFI supports a variety of northern food security and food sovereignty initiatives in over 70 rural and remote communities in Manitoba. Activities include a revolving loan freezer-purchase program, school nutrition programming, nutrition awareness, composting and food preservation workshops, greenhouse development, traditional harvesting programs, and animal husbandry. Through the NHFI, Food Matters Manitoba works with 13 remote First Nations communities to develop and build community food plans, which have included the creation of over 50 community gardens that together yielded 20,000 pounds of vegetables in one year. Websites: http://www.gov.mb.ca/ana/nhfi.html ; http://foodmattersmanitoba.ca/content/fmm-northern-healthy-foods-initiative
NWT Territorial Farmers Association (TFA)	Governed by a Board of Directors representing several communities across the territory, the TFA was established by South Slave and Deh'cho farmers in 1974. The TFA is a hub for information on northern gardening and agriculture. Website: http://www.farmnwt.com/producing-food
The Indigenous Circle at Food Secure Canada (ICFSC)	The ICFSC supports information sharing and action to increase food sovereignty for Indigenous peoples. Website: http://foodsecurecanada.org/indigenous-circle
Indigenous Food Systems Network (IFSN)	This British Columbia-based network encourages those involved with Indigenous food-related action, research, and policy to share resources and information. It was developed by the Working Group on Indigenous Food Sovereignty, which aims to ensure Indigenous voices are included in food security discussions and includes traditional harvesters, Aboriginal community members, researchers, and NGOs. Website: http://www.indigenousfoodsystems.org

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Organization	Approach
Community-Based Research Hubs	
Arctic Institute of Community-based Research (AICBR)	AICBR aims to facilitate and promote community-based, northern-led health research activities, with the goal of improving the health of Yukon First Nations and non-First Nations residents. Food security is one of the Institute's priority areas. The AICBR has hosted six conferences or workshops and participated in seven projects related to food security in Yukon. Website: http://www.aicbr.ca/ourPriorities/foodSecurity/home
Community-based Research Canada (CBRC)	CBRC is a network of people and organizations engaged in community-based research to meet the needs of people and communities. Of particular relevance to the assessment is the CBRC's work on creating opportunities for existing community-based research interests to collaborate in their respective focus areas to share practices, outcomes, and findings. Website: http://communityresearchcanada.ca/who_are_we
Local Initiatives	
Feeding My Family	The Feeding My Family Facebook Group represents an example of community mobilization around the issue of food insecurity, using social media. Created in 2012, the initiative has focused on bringing awareness about the high cost of food and its effects, but has also given those who are part of the forum a platform from which to mobilize for change. The group uses a combination of traditional knowledge and practical advice about how to cook market/imported food, has fostered community-based solutions to food insecurity (such as establishing food banks), and has promoted greater collaboration with local and territorial governments. Website: http://www.feedingmyfamily.org
Qaujigiartiit Health Research Centre	The goal of the Centre is to enable health research to be conducted locally, by Northerners, and with communities in a supportive, safe, culturally sensitive and ethical environment, as well as to promote the inclusion of both Inuit and Western epistemologies and methodologies (ways of knowing and doing) in addressing health concerns, creating healthy environments, and improving the health of Nunavummiut. Website: http://www.qhrc.ca
Food Security Network of Newfoundland & Labrador (FSN)	FSN was formed in 1998 when a group of dietitians came together to address the issues of hunger, poverty, and food insecurity in Newfoundland and Labrador by promoting community-based solutions. Website: http://www.foodsecuritynews.com/about-food-security.htm

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Organization	Approach
Centres for Indigenous and Northern Research	
Centre for Indigenous Peoples' Nutrition and Environment (CINE)	McGill University's CINE was created in 1992 in response to an identified need to address Indigenous peoples' concerns about the integrity of traditional food systems. With the goals of promoting traditional knowledge of nutrition and environment and responding to concerns of local communities about their food, food use, and environment, CINE is a multidisciplinary resource for community-based research and education related to traditional food systems. Website: http://www.mcgill.ca/cine/about
Nasivvik Centre for Inuit Health and Environmental Change	Established in 2003 at Laval and Trent University through funding from the Canadian Institutes of Health Research, Nasivvik is one of Canada's nine Network Environments for Aboriginal Health Research (NEAHR). With the assistance of Inuit Research Advisors in each Canadian Inuit region, this multidisciplinary centre aims to build northern community capacity through training, research, and education. Website: http://www.nasivvik.ca
Institute for Circumpolar Health Research (ICHR)	Located in Yellowknife, NWT, ICHR is an independent research organization dedicated to health research relevant to circumpolar regions and the people who live there. Doctors, community members, cultural experts, and health and environmental experts work together to develop youth-driven, community-based research methods, understand socio-economic determinants of health, and assess the impacts of health research. ICHR is involved in food security research projects. Website: http://ichr.ca/about/overview
Nunavut Research Institute (NRI)	NRI's mandate is to develop, facilitate, and promote scientific research as a resource for the well-being of people in Nunavut. In addition to research licensing, some of the Institute's central objectives are to support the involvement of Nunavut residents in scientific research, incorporate *Inuit Qaujimajatuqangit* into research design, promote skills training and outreach to build local research capacity, and broker research projects and partnerships that meet the needs of local residents. Website: http://www.nri.nu.ca/apps/authoring/dspPage.aspx?page=about
Aurora Research Institute (ARI)	At ARI, the goal is to improve quality of life for NWT residents by using scientific and traditional knowledge to address northern issues and promote social and economic goals. In addition to research licensing, ARI encourages communication between researchers and community members, cultivates a NWT scientific community that recognizes and uses traditional knowledge, and supports research that contributes to the well-being of NWT residents. Website: http://www.nwtresearch.com/about-us
Nunavik Research Centre (NRC)	At this community research facility in Kuujjuaq, Quebec, research is conducted on wildlife management and the quality of country food. The NRC also undertakes a range of environmental studies. Website: http://www.polarknowledge.ca/index.php?page=northern-research-facilities&hl=en_US&facil=45

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Organization	Approach
ArcticNet (Network of Centres of Excellence of Canada)	At Université Laval, the interdisciplinary ArcticNet brings together scientists, decision-makers, Inuit organizations, northern communities, government agencies, private-sector partners, and international research teams to study the effects of climate change in the coastal Canadian Arctic. To address knowledge gaps and research challenges, the research program includes 36 research projects grouped into four Integrated Regional Impact Studies. One of the main goals is to translate scientific findings into policy. Website: http://www.arcticnet.ulaval.ca
Nain Research Centre	Established in April 2011, the Centre aims to support the knowledge needs of a healthy and prosperous Nunatsiavut. It is managed by the Environment Division of the Nunatsiavut Government and is dedicated to action-oriented research as well as the desire to further nurture and grow local capacity, including research-related capacity. The Centre and the Nunatsiavut Government's Environment Division are currently leading or co-leading several major research programs in the region, including ones related to food security, through key strategic partnerships across governments, universities, and other stakeholders. Website: http://nainresearchcentre.com

10.1.1 Identifying Promising Practices

In addition to indicating how knowledge systems are contributing to food security research, the Panel underlined the importance of focusing on the evidence base that informs strategies to mitigate food insecurity among northern Aboriginal populations. Because food insecurity is experienced differently at individual, household, community, and regional levels, it follows that strategies to mitigate food insecurity must be similarly diverse. Glacken (2010) groups strategies to address food insecurity into three categories: short-term, temporary solutions (e.g., food banks and children's feeding programs); capacity building and skills development (e.g., community gardens and cooperative buying clubs); and organizational change and policy responses (e.g., food system interventions, food policy networks, and participatory food costing).

Toronto Public Health's major report on *Food Security Implications for the Early Years* (McKeown, 2006) observed that, as of 2006, the two provincial public health associations that most strongly promoted food security were the Ontario Public Health Association (OPHA) and the Public Health Association of British Columbia (PHABC). Although not targeted specifically towards northern Aboriginal populations, the OPHA and PHABC offer suggestions to other health units wishing to enhance the effectiveness and scale of community food security work. These include increased coordination among public health officials and within health units for the implementation of food-related programs; staff allocation and skills training in health units to facilitate integrated food systems

research and development; support for community networks; inter-sectoral partnerships across environmental, economic, and social sectors of the food system (OPHA, 2002 in McKeown, 2006); establishment of a food security team that works with decision-makers; assessment of food security needs in the jurisdiction; communication with and support of community groups interested in food security; development of a food security action plan; dedication of human and financial resources to food security projects; implementation and evaluation of initiatives; and development of food security policies (PHABC, 2004, in McKeown, 2006).

Across Canada, Epp (2011) identified 125 policies, programs, and reports related to government action on food (in)security in the provinces and territories. In British Columbia, food security is a core program for health authorities, the purchase of BC-grown products is encouraged, and programming exists to promote healthy eating. Strategies include the Community Food Action Initiative, the Farmers' Market Nutrition and Coupon Project, Farm to School Salad Bar, and the Produce Availability in Remote Communities Initiative. Ontario is a leader in promoting local food products, as demonstrated by the Broader Public Sector Investment Fund: Promoting Ontario Food, which funds projects to make local foods available in Ontario institutions. In addition, the Ontario Market Investment Fund promotes Ontario-produced foods and encourages Ontarians to buy locally (Epp, 2011). Through innovative legislation, Quebec's *Act to Combat Poverty and Social Exclusion* (2002) and the resulting 250 projects over three years made Quebec a Canadian leader in addressing food security for low-income people (Epp, 2009). Nova Scotia's Ministry of Health Promotion and Protection has prioritized food security since 2005 with Healthy Eating Nova Scotia. Newfoundland and Labrador appears to have been the first province to create a subsidy program to reduce the cost of healthy food in northern regions (the 1997 Air Foodlift Subsidy) (Epp, 2009). Recently, former Premier Eva Aariak and Nunavut Tunngavik Inc. President Cathy Towtongie signed a *Memorandum of Understanding on the Nunavut Roundtable for Poverty Reduction* and announced the development of a Nunavut Food Security Strategy (see Box 10.2). Many of the national initiatives to address hunger, and now food security, lack the sustainability required to fully assess their effectiveness (Epp, 2009).[40]

Although more program evaluations are needed, there have been several efforts to identify promising practices to promote food security in northern Aboriginal communities. A current selection of these projects, along with their main features, is presented in Table 10.2. Although there are several different methods of

40 Relevance, effectiveness, efficiency, and sustainability are criteria traditionally used in project management to evaluate programs (Cacace, 2009).

identifying and evaluating promising practices in northern food security, all of them convey the importance of community consultation and participation, as well as the necessity of access to adequate amounts of nutritious food for healthy diets. The Panel hopes that this resource will be of use to stakeholders as they consider options to support and improve food security in First Nations, Inuit, and Métis communities.

Table 10.2

Different Aspects and Indicators of Promising Practices

Project	Features
Profiles of Food Security Activities in Inuit Communities (Carry, 2012) **Identifies:** selection criteria for promising practices for food security in Inuit communities	• Potential for replication • Uniqueness/innovation • Support for cultural values and cultural food • Promotion of system capacity (self-reliance as well as networks) • Strengthening of Inuit capacity (traditional Inuit skills) • Creation of community infrastructure • Preservation/transfer of cultural knowledge • Public appeal • Strong focus on youth engagement
Promising Practices for Food Security (Glacken, 2008a) **Identifies:** characteristics of promising practices for food security in First Nations and Inuit communities	• Increased availability of nutritious food • Capacity building • Strong partnerships • Clear benefits • Creative approaches • Secure and adequate funding
Priority Areas for Action in a Nunavut Food Security Strategy (NFSS, 2013) **Identifies:** themes of approaches and priorities to increase food security in Nunavut	• Country food access • Market food access • Policy and legislation • Life skills • Local food production • Programs and community initiatives
The NWT Food Security Project (Glacken, 2008b) **Identifies:** possible solutions to decrease food insecurity across the NWT	• Nutrition education • Increased community involvement • Addictions counselling • Increased access to traditional/country food and nutritious store food • Enhancement of existing programs • Enabling of living wages through income support

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Project	Features
Circumpolar Inuit Health Priorities: Best Health Practices and Research (ICC, 2012) **Identifies:** commonalities of best practices to improve food security	• Empowered people with knowledge about healthy diets • Increased availability of healthy food and access to healthy diets
What food system intervention strategies and evaluation indicators are successful with Indigenous Peoples? (Kuhnlein, 2013) **Identifies:** broad strategies that can improve food security and health in economically poor Indigenous communities globally	• Building and expansion of knowledge of positive health benefits of traditional/country food and local culture • Focus on women's, children's, and youth health • Use of local leadership for decision-making on relevant strategies • Strategies with local capacity building and self-determination • Emphasis on activities in schools and with Elders • Enhanced networking among engaged communities on shared food insecurity issues and strategies for their abatement • With respect to improving quality of market food: reduced prices of healthy food via enforcement mechanisms, increased prices of nutrient-poor, high-energy food and drinks, and increased education and demand for healthy and nutritious food with provision of information about the effects of poor diets on health

10.1.2 Strategies to Build Food Security and Food Sovereignty

Through the identification of initiatives that appear to be particularly important to improving northern Aboriginal peoples' food security and food sovereignty, the Panel's contribution builds on the findings listed above. Its review is not comprehensive; rather, it intends to illustrate the diversity of programs and initiatives that can be employed to help promote food security in northern First Nations, Inuit, and Métis communities. Although each of the interventions described in this chapter has been identified as important to mitigating food security, the Panel observed that there is no single solution to "solving" food insecurity issues in the North. Nutrition education programs are valuable, but they cannot compensate for poor access to food, for example (Kuhnlein, 2013). An array of multilevel approaches based on inter-sectoral collaboration among communities, local agencies, government, and institutions is important for sustainable initiatives (Sharma *et al.*, 2010; Kuhnlein, 2013; Wakegijig & Osborne, 2012; Wakegijig *et al.*, 2013). The Panel noted that stable funding is a key factor that contributes to the sustainability of any of these initiatives.

Importantly, the diverse needs and assets of communities should be clarified before initiatives are implemented (Glacken, 2008b). Community food assessments have been identified as a useful tool in this regard (BCPHSA, 2008; NFPPSC, 2003; Flowers *et al.*, 2010). While major impacts of food insecurity and changes in the Canadian North are being felt by Northerners, major solutions are also being

generated by Northerners. This is especially important considering that, apart from Nutrition North Canada, Canadian social policies tend not to explicitly deal with hunger, nor are they evaluated on their ability to respond to food security (PROOF, 2012). As a key source of resilience and innovative ideas, communities must be included in creating the solutions that will build food security (see Box 10.1). The Panel noted evidence that long-term alleviation of food insecurity requires drawing on the assets, capacities, and abilities of northern communities, as well as addressing numerous factors that contribute to the inequities underlying food insecurity (e.g., Kuhnlein *et al.*, 2013b).

Box 10.1
Implementing Successful Strategies

Project leaders' **commitment** and **capacity** are essential for the success of interventions in communities of Indigenous Peoples. How and by whom activities are organized and carried out are of crucial importance, and there must be genuine community ownership, such as involving women's organizations and leaders. **People are not just the beneficiaries of programs; they make programs happen**. Community ownership is developed through the involvement of community partners in program planning, initiation, organization, and implementation. Community leaders recognize what seems **reasonable and operationally realistic** for the community.

— Dr. Harriet Kuhnlein on creating successful food system interventions for the benefit of Indigenous people (Kuhnlein, 2013)

This affirms the importance of food sovereignty as a means by which to achieve food security (Patel, 2012) (see Chapter 1). The term *food sovereignty* speaks to the importance of individuals' and communities' abilities to take control of their own food production, preparation, and consumption, as well as obtaining the necessary education, knowledge, and skills to achieve food security. Furthermore, food sovereignty is understood to foster the economic, political, and cultural sovereignty of peoples (WFFS, 2001). As Thompson and colleagues (2011) explain, the access and control of resources are influenced by institutional structures, programs, and policies, which operate at multiple levels. The conditions supporting the empowerment of Aboriginal peoples to make decisions about their own food systems require the promotion of practices that encourage the realization of aspirations set forth in the UNDRIP (UN, 2008), such as land and resource rights, the improvement of economic and social conditions, and the enjoyment of the highest attainable standards of health. The Panel pointed to wildlife co-management partnerships, harvester support programs, and the

involvement of community members in the governance of local food stores as promising practices in this regard. To convey the interconnected nature of food security and food sovereignty, strategies to promote both are integrated throughout the text below.

What follows is a small sample of the many types of strategies activated across northern Canada. Although, as has already been pointed out, evaluation data and "best practices" information related to food security are very limited (Glacken, 2008a), this section provides examples of actions that aim to increase food sovereignty and food security in northern Aboriginal communities. For ease of reference, these actions are broadly classified as (a) programs to increase the affordability and availability of healthy food, (b) health and education programs, (c) community wellness and intergenerational knowledge sharing, (d) harvester support and sustainable wildlife management, (e) poverty reduction and community economic development, (f) innovation in infrastructure, transportation, and local food production, and (g) youth engagement.

a) Programs to increase the affordability and availability of healthy food

Although traditional/country food remains an important part of the diets of northern Aboriginal peoples, a nutrition transition is occurring across northern Canada (Egeland *et al.*, 2011), especially among younger generations (Wein *et al.*, 1990; Kuhnlein *et al.*, 2004). Considering the high cost of market food in communities across northern Canada compared with southern Canada (see AANDC, 2010a), adequate amounts of high-quality, healthy market food need to be made affordable and available. As identified in Chapter 9, food subsidies are an important enabler of these pillars of food security (Lambden *et al.*, 2006). The Panel determined that unless the high costs of nutritious market/imported food can be reduced and adequate and appropriate infrastructure developed to support local food production and food sovereignty, food subsidy programs will remain an important component of an overall strategy to mitigate food insecurity in northern Canada. Dedicated programs that aim to create the conditions that further empower communities with the tools for local food production are also important.

Examples:

- **Nutrition North Canada:** A transportation subsidy program provided by the Government of Canada to reduce the cost of perishable healthy food in isolated northern communities.
- **Air Foodlift Subsidy Program** (AFS) (NL): Established by the Government of Newfoundland and Labrador in 1997 to ensure that nutritious, perishable items such as fruit, vegetables, and dairy products are available for Labrador's coastal communities. Under the AFS program, a subsidy is paid to retail stores

to offset the high cost of flying perishable food into these communities. Any savings to retailers are required to be passed on to the consumer through the cost of goods sold (LAO, 2013).

- **Healthy Foods North** (NU, NWT): An intervention program to improve diet and reduce the risk of chronic disease in Aboriginal populations. In collaboration with retailers, workplaces, and community partners, the program aims to increase access to healthy food and provide nutrition education and skills (Sharma *et al.*, 2010).
- **Northern Healthy Foods Initiative** (NHFI) (MB): An initiative whose primary focus is on local food self-sufficiency in remote and northern Manitoba communities. NHFI offers resources on gardening basics, soils and gardening in the North, information about freezers and freezing food, and zoonoses. In 2011–2012, over 80 communities were involved in NHFI. Eight hundred gardens and 59 greenhouses or geodesic domes were in operation as of 2011, and in 2010–2011, 13 communities and 29 families worked with small animals (Government of Manitoba, 2012).
- **Growing Forward** (NWT): An initiative that focuses on simple, effective programs that are tailored to the needs of the NWT agricultural community. It includes a small-scale food program, a northern agri-food program, a commercial harvest program, an inter-settlement trade program, Agriculture in the Environment, and a Bison Management Strategy (GNWT & Government of Canada, 2011).

Courtesy of Gene Hachey

Figure 10.1
Children Harvest Food from a Garden in the NWT with the Growing Forward Program

b) Health and education programs

While access to, and availability of, healthy food is important, these components alone will not necessarily lead to nutritionally adequate diets and subsequently improved health outcomes. Nutrition security is only achieved when individuals select, prepare, and consume the food they need based on knowledge about nutritional value and impact (CFS, 2012). As a result, educational programs to promote food knowledge, health, and wellness have been identified as valuable components of food security strategies. These types of initiatives generally intend to build knowledge about more recently introduced market food, as well as provide information about the health benefits and risks of traditional/country food. They include nutrition education programs (Kuhnlein *et al.,* 2001; Paci *et al.,* 2005; Chan *et al.*, 2006; Carry, 2012); school snack programs (Skinner *et al.,* 2012); programs that focus on empowerment approaches and self-efficacy, such as those that teach shopping and food preparation skills (Mead *et al.,* 2010a, 2010b; Mercille *et al.*, 2012); educational activities regarding financial management skills (Gunderson & Garasky, 2012); and traditional/country food safety initiatives (Proulx *et al.*, 2002). When possible, interventions based on general dietary improvements rather than single nutrients as supplements have been identified as important to nutrition security (Berti *et al.*, 2008; Kuhnlein *et al.*, 2001). These initiatives have the advantage of being potentially sustainable, having multigenerational reach, and responding to the need to improve overall diet (Verrall, 2005).

Examples:

- **Canada Prenatal Nutrition Program**: A program designed to improve maternal and infant nutritional health. The program is funded by Health Canada and managed by the provincial and territorial governments.
- **Nunavut Food Guide Recipe Program**: A program that has been working with food suppliers in communities to feature recipe ingredients, provide taste testing, and reduce the cost of ingredients each month when a different recipe is featured.
- **Nunavik Food Guide**: A guide developed by the Nunavik Regional Board of Health and Social Services in 2012. This guide is illustrated using an igloo with images that promote healthy lifestyles. The igloo shows four layers of food types and emphasizes nutritionally dense country food.
- **Health Canada's Food Guide for First Nations, Inuit and Métis:** A guide based on Canada's Food Guide but designed to reflect the values, traditions, and food choices of the targeted communities. It includes choices from both traditional/country and store-bought food.

c) Community wellness and intergenerational knowledge sharing

Several initiatives that promote community wellness and intergenerational well-being have been identified as enablers of food security. These include practices that encourage family eating and sharing practices (Duhaime *et al.,* 2002; Sharma *et al.*, 2010); initiatives that promote intergenerational knowledge and skills transmission (Ilisaqsivik, 2013; Carry, 2012), including land skills (Allard & Lemay, 2012); community-led food assessments (BCPHSA, 2008; Flowers *et al.*, 2010); and asset mapping (NFPPSC, 2003). Also important are programs that consider the relationships of different groups with food security issues and/or target populations at higher risk of food insecurity, including women (Kararowski, 2006; Beaumier & Ford, 2010), pregnant women and mothers (Verrall, 2005; Willows *et al.*, 2005; Berti *et al.*, 2008), teenage girls, children (Egeland *et al.*, 2010), and those who experience lower socio-economic status (Lardeau *et al.*, 2011). Egeland (2011) suggests that actions to mitigate food insecurity could include strengthening support systems for Inuit families with children (Egeland, 2010b) and public health interventions to address inadequate housing, poverty, food insecurity, and the nutrition transition towards costly market food.

Examples:

- ***NiKigijavut Hopedalimi***: A community-led food assessment in Hopedale, Labrador undertaken to develop community-based solutions to respond to local food security concerns. In partnership with the Food Security Network of Newfoundland and Labrador, a community steering committee, and an advisory committee composed of provincial and national members, this project used community priority setting to develop a community action plan for increased food security (Flowers *et al.*, 2010).
- ***Ilisaqsivik***: A non-profit community-based organization dedicated to promoting community wellness, based in Clyde River (NU). Of the many cultural programs it offers, several are land-based. These include summer healing and cultural retreats, dog teaming programs (Qimmivut, Our Dogs), harvesting trips, Elder and Youth camping trips, Men's Group and Women's Group retreats, Father/Son Program, land-based healing activities, and the Community Justice Diversion and Healing Program. In many of the programs, such as the Father/Son Program and Qimmivut, youth go on the land with experienced hunters, *qimuksiqtiit* (dog teamers), and Elders. The programs promote mental, spiritual, and physical well-being, and participants learn important knowledge, skills, and values related to travel, harvesting and providing food, and maintaining livelihoods on the land. Founded, led, and staffed by Clyde River residents, Ilisaqsivik has been recognized with several awards and represents a promising example of how community organizations can build on existing strengths and develop multi-sector partnerships to create innovative programs that meet their needs (Gearheard & Gearheard, personal communication, 2013; Ilisaqsivik, 2013).

d) Harvester support and sustainable wildlife management

As described in Chapter 5, hunter/harvester support programs (HSPs) are designed to support traditional harvesting practices and the production and consumption of traditional/country food. Some argue that they represent the most accepted and successful form of traditional/country food commoditization because they encourage food sharing (Gombay, 2005). In addition to HSPs (Kishigami, 2000; Gombay, 2009), initiatives that increase the accessibility of fishing and hunting tools (Lambden *et al.*, 2006), encourage community hunts (Glacken, 2008b), and provide access to community freezers (Duhaime *et al.*, 2002; Douglas & Chan, 2012) are important for food security and food sovereignty. Restoration of disturbed lands and re-introduction of extirpated wildlife populations have not been a major component of past northern wildlife management, although mine site reclamation as well as caribou, bison, and muskox introductions are localized exceptions. These more intensive management approaches may become more common as northern resource development and wildlife management intensify (Le Hénaff & Crête, 1989; Ouellet *et al.*, 1993; Larter *et al.*, 2000).

The peoples inhabiting the various regions of the Arctic spend vast amounts of time on the land and at sea. Drawing on personal experience, information shared with others, and knowledge handed down through the generations, residents of the Arctic are able to recognize subtle environmental changes and offer insights into their causes (ICC, 2008). Allard & Lemay (2012) note that ice monitoring, trail marking, and access to survival equipment should also be encouraged for the safe harvesting of traditional/country food. While the record of Canadian Arctic co-management institutions is mixed (Berkes & Armitage, 2010), approaches to wildlife management that balance sustainable harvesting with conservation principles have been identified as key considerations in long-term food security and food sovereignty (Allard & Lemay, 2012; NFSS, 2013). Further, monitoring helps to assess the population status and health of wildlife populations, which informs sustainable harvest limits. Much of this monitoring and adaptive management occurs informally between individuals and communities, but these can also be formalized as community-based monitoring programs. The Conservation of Arctic Flora and Fauna has undertaken a wide range of activities to facilitate and promote community-based monitoring, especially through the Circumpolar Biodiversity Monitoring Program.

Examples:

- **Harvester support programs**: Programs that include the Nunavut Harvester Support Program (NU), the Community Harvester Assistance Program (NWT), the Inuvialuit Harvesters Assistance Program (NWT), the Inuit Hunting, Fishing and Trapping Support Program (Nunavik), and Eeyou Astchee,[41] the Cree Hunters and Trappers Support Program (James Bay).
- **Community monitoring programs:** Programs that include the Community Moose Monitoring Project and the Community Ecological Monitoring Project (Yukon) (Gofman, 2010).

Box 10.2
The Nunavut Food Security Strategy

In response to growing concerns about the availability, accessibility, acceptability, and quality of food in communities across Nunavut, development of the Nunavut Food Security Strategy began with a series of roundtable sessions in the fall of 2012. A Nunavut Food Security Symposium was held in January 2013 in Iqaluit, and a food security strategy for Nunavut is expected to be released in 2014.

The process brought together members of the Nunavut Food Security Coalition and representatives from organizations involved in the production, distribution, and consumption of food in the territory, including harvesters, producers, retailers, Inuit organizations, government departments, communities, and NGOs. The Nunavut Food Security Coalition is composed of representatives from seven Government of Nunavut (GN) departments, Nunavut Tunngavik Incorporated (NTI), and each of the three Regional Inuit Associations. The coalition is co-chaired by GN's Department of Health and Social Services and NTI's Department of Social and Cultural Development (GN & NTI, 2012).

While there is no single solution to mitigating food insecurity in northern Canada, the opportunities for change are abundant. The work of the Coalition demonstrates that communities are a key source of resilience and innovative ideas, helping to create the solutions that will build food security and food sovereignty.

41 Sometimes spelled *Eeyou Istchee*.

e) Poverty reduction and community economic development

As outlined in the Panel's conceptual framework and elaborated upon in Chapter 7, northern Canada's mixed economic system is a factor that can be interpreted as both an enabler of and a barrier to food security. Compared with much of the rest of Canada, northern Canadians generally experience higher rates of unemployment, lower indicators of health and education status, and stronger dependence on public housing (see Impact Economics for data on Nunavut, 2011). While poverty is a complex issue, two obvious aspects of poverty reduction are related to food security. Part of the approach includes direct interventions to address poverty (Egeland, 2011), such as social assistance programs, strengthening support systems for Inuit families with children (Egeland *et al.* 2010d), and programs that aim to diminish crowding in homes (Egeland, 2009). The other component includes initiatives that promote self-reliance in the long term, such as food-related community economic development (GN & NTI, 2011), which builds local capacity to respond to poverty, hunger, and inequality (Thompson *et al.,* 2012). These initiatives provide employment and essential services at the community level.

Social enterprises can be an effective means to address development with social benefits (Islam & Berkes, 2012). Food cooperatives, for example, may help commercial harvesters to access markets to sell food with high economic value, and they may also enable the diversion of by-catch and low-value species for local use (Islam & Berkes, 2012). Since incorporating in 1972, 31 cooperatives now operate across Nunavut and the NWT as part of Arctic Co-operatives Limited (ACL, 2012). Owned and controlled by shareholding members, cooperatives are based on the principles of voluntary membership; democratic member control; member economic participation; autonomy and independence; education, training, and information; cooperation; and concern for community. An example of a cooperative that has been identified as particularly successful is presented below; however, it is not necessarily generalizable to the North. Research has yet to validate the effectiveness of food cooperatives versus other models across northern Canada.

Examples:

- **Neechi Foods Co-op and fish-buying club**: A self-reliant and profitable Winnipeg enterprise that for over 21 years has been identified as an ideal example of an Aboriginal community development initiative (Islam & Thompson, 2011). In addition to market food, Neechi Foods Co-op sells locally grown, harvested, and produced food items (e.g., bannock, wild rice, and freshwater fish). Through coordination with northern harvesters, a fish-buying club was recently developed to provide northern harvesters with a steady market and source of income.

- **Bayline Northern Food Security Partnership**: A partnership formed in 2001 by leaders from small Aboriginal communities located along the Hudson Bay Railway line in northern Manitoba. The Bayline Regional Roundtable has provided supplies for gardens, built greenhouses, supplied chickens and turkeys, purchased freezers, and offered workshops in eight northern communities. Projects are funded through the Public Health Agency of Canada, NHFI, and Manitoba Agriculture Food and Rural Initiatives (BRR, 2009).
- **The Makimaniq Plan**: A poverty reduction plan created by the Government of Nunavut and NTI to address the challenges of poverty. The initiative was undertaken through a public engagement process. It identifies six themes, including food security.
- **Project Nunavut**: An Iqaluit-based social enterprise with a focus on high-impact projects that positively contribute to the local economy. Examples include the outdoor Country Food Market and Project Sealift (a service that provides annual sealift delivery of goods). Proposed future projects focus on fisheries development, an independent workers' cooperative, and wind power production.

f) Innovation in infrastructure, transportation, and local food production

The Panel concluded that the logistics of food transportation, storage, and sale in northern Canada, discussed in Chapter 6, are major barriers to food security. Initiatives that focus on innovations in infrastructure, transportation, and food sovereignty represent promising practices in this regard. These include finding sustainable and affordable ways to increase the availability of traditional/country food in communities via commercial sale and distribution (Allard *et al.*, 2012; NFSS, 2013), including traditional/country food markets (Project Nunavut, 2013); farmers' markets (Francoeur, 2013); community gardens and greenhouses that extend the growing season (UAF, 2010; University of Saskatchewan, 2012; Exner-Pirot, 2013); community composting initiatives (NFSS, 2013); indoor or outdoor small-scale container gardening (FMM, n.d.); regional food networks (White & Sheppard, 2011); sustainable northern agriculture, such as new options in crop or livestock production (MAFRI, n.d.); innovations in transportation, such as transport airships (Prentice, 2012); and solar and wind energy production (White & Sheppard, 2011; Project Nunavut, 2013).

Examples:

- **Northern Farm Training Institute** (NFTI): A program based in Hay River, NWT, and designed and run by Northerners for Northerners. The NFTI offers experiential training opportunities for sustainable food production in the North (NFTI, 2013).

- **Inuvik Community Greenhouse**: A volunteer-based organization that, in conjunction with local, territorial, and federal partners, operates a greenhouse that offers community gardens and commercial plots. This represents the most northerly greenhouse in operation in North America (PHAC, 2009), but it is only one of many models in operation across northern Canada.
- **Composting in Whitehorse**: A two-year pilot project for a local composting facility operated by Boreal Compost Enterprises in partnership with the Centre for Systems Innovation, the Compost Quality Alliance, the Compost Council of Canada, and the City of Whitehorse. The territory and city aim to divert up to 50% of organic waste from landfills annually. Topsoil packages are then sold for a profit (Kerr, 2012). Smaller models of composting are in operation in other parts of northern Canada (e.g., Compost Iqaluit, run by the Bill Mackenzie Humanitarian Society).

g) Youth engagement

Practices that promote intergenerational knowledge transmission appear to be key for youth engagement. As explained by Norma Kassi, former Vuntut Gwich'in Chief and co-founder of the Arctic Institute of Community-Based Research, "it is imperative at this time of adverse changes to our entire being as a peoples, that we engage the youth in every aspect of education of our ways of cultural survival and adaptation strategies, so that upon adulthood they will hold the tools that will be of most importance to continue forward" (in Butler Walker *et al.*, 2011).

Examples of promising practices aimed towards youth[42] include the use of technologies (such as Photovoice, Elder stories in DVD format, youth radio drama) to understand food security issues (Lardeau *et al.*, 2011; Kuhnlein, 2013); provide nutrition education programs (Hamilton *et al.*, 2011); on-the-land programs (Carry, 2012; Gearheard & Gearheard, personal communication, 2013; Sheldon, personal communication, 2013); and programs that build capacity and empower youth with knowledge related to food security, climate change, and research methods (e.g., *Vuntut Gwich'in Climate Change and Health Research in Northern Yukon,* Butler Walker, 2011). Because food security is closely tied to education, culturally relevant education programs that reflect northern Indigenous values and realities are important (Paci *et al.*, 2005). Please refer to Box 10.3 for more information.

School snack programs piloted in remote First Nations communities of Fort Albany, Kashechewan, and Attawapiskat, in northern Ontario, have been identified as promising examples of methods to improve children's access and consumption of nutritious market food (Skinner *et al.*, 2012; Gates *et al.*, 2013). Box 10.3 contains profiles of a select number of these initiatives.

42 Not all have been evaluated for efficacy.

Box 10.3
Examples of Promising Practices to Promote Local and Traditional/Country Food Consumption Among Youth

Example 1: Northern Grow Program (MB)

Through Manitoba's Frontier School Division, the Northern Grow Program is a school-based strategy to encourage healthy eating in northern and remote communities. Funded through the Government of Manitoba's Northern Healthy Foods Initiative, 240 gardens were supported in 2011. Activities include the provision of supplies such as geodesic domes, seedlings, grow lights, and pots. A berry nursery was started in the community of Leaf Rapids, which also has two greenhouses, a hydroponic growing area used by students, and a student mentorship program to engage youth and build skills to become trained gardening technicians.

The program provides opportunities for students for physical activity, healthy eating, and learning. Benefits can extend to children's families and communities through opportunities to gain technical expertise in gardening and greenhouse management, and through the provision of local infrastructure for food sovereignty (Government of Manitoba, 2012).

There are many other examples of greenhouse projects in the North, as illustrated by the Inuvik Community Greenhouse.

Inuvik Community Greenhouse

Courtesy of Kue Young

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Example 2: Take a Kid Trapping and Harvesting (NWT)

The purpose of Take a Kid Trapping and Harvesting is to introduce NWT youth to the traditional practices of hunting, fishing, trapping, and outdoor survival skills. Developed in 2002, this cost-sharing program responds to concerns about diminishing intergenerational knowledge and skills transmission. The government of the NWT provides funding to schools across the territory to organize on-the-land skills training, which can last up to two weeks. In addition to hunting, fishing, and gathering food, the groups often teach traditional food preparation, tracking, respect for the environment, equipment repairs, and important lessons about proper preparedness for on-the-land excursions (Carry, 2012). Carry notes that since the program was launched, more youth have been involved in the trapping sector.

In 2009–2010, the program supported 39 projects involving 1,726 participants, at a total cost of $305,000, or about $177 per person (GNWT, 2011). When the program was initiated in 2002, it had 386 youth participants. As of 2011, the number has grown to 2,274 youth from 49 schools (Carry, 2012).

Example 3: Aullak, sangilivallianginnatuk, Going Off, Growing Strong in Nain, Nunatsiavut (NL)

This pilot youth outreach program represents the first project in Canada to bring together a group of youth and harvesters to strengthen a community freezer program. It was developed in response to community demand for intergenerational knowledge exchange between community youth and hunters. Ten youth, aged 14 to 21, and 16 harvesters participated in this pilot project. Upon completion, participants gain the designation of "Junior Harvester." Program activities include large and small group trips and community-based activities where youth share their harvests with Elders.

The program aims to empower youth with skills to provide for their families and community, teach others, and preserve traditional ways of life. This multi-sectoral partnership is led by the Nunatsiavut Government Department of Lands and Natural Resources and the Nain Inuit Community Government, based in the Nain Research Centre, and in partnership with community members, government departments, local health authorities, schools, and others.

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Example 4: Kugluktuk High School, School Cooking Club (NU)

To address the problem of inadequate nutrition among students, teachers and staff at Kugluktuk High School joined together to develop the School Cooking Club. The program began around 2007 as a healthy breakfast initiative with a lunch pilot every Friday. Since then, the program has expanded so that students (aged 11 to 18) can participate in shopping, fishing, and harvesting activities, as well as the preparation and serving of meals for 70 to 80 students daily. With the help of volunteers, food safety, food preparation, land skills, knowledge about country food, and nutrition lessons are now integrated into the cooking club. In addition to these benefits, Carry (2012) notes that the program empowers students with a greater ability to focus on their schoolwork, as well as develop cooperative skills and respect for one another.

10.2 INTERNATIONAL APPROACHES

The vast circumpolar region encompasses diverse social, cultural, geographical, political, policy, and economic contexts. In addition, the many dimensions of food security require multidisciplinary, highly organized, community-based research approaches. These factors present challenges. But scientific curiosity, the desire to conduct quality research that responds to urgent and socially relevant questions, and a number of clear similarities across the circumpolar region have enabled the development of several international initiatives that investigate different dimensions of food security (Duhaime & Bernard, 2008).

Food security has captured the attention of major stakeholders interested in the Arctic, especially Aboriginal and international organizations (Duhaime & Bernard, 2008). The eight members of the Arctic Council, as well as the six permanent participants — Arctic Athabaskan Council, Aleut International Association, Gwich'in Council International, Inuit Circumpolar Council, Russian Arctic Indigenous Peoples of the North, and Saami Council — represent important players in the search for traditional knowledge networks that contribute to food security research, as well as international approaches to developing scientific evidence and knowledge systems in support of interventions to mitigate food insecurity. In general, international approaches include the use of research networks across circumpolar states, as well as partnerships between university researchers, government agencies and departments, Indigenous groups, northern communities, and industry. There is much that Canadian researchers and policy-makers can learn from, as well as contribute to, these organizations. Some major northern networks and institutions that deal with northern food security and its related issues include, but are not limited to, the resources outlined in Table 10.3.

Table 10.3

Examples of Northern Food Security Research: International Resources

Organization	Approach
United Nations Committee on World Food Security (CFS)	Canada is a member of the CFS, which serves as an intergovernmental forum for reviewing food security policies and monitoring the effectiveness of actions for reducing hunger. The Committee's High-level Panel of Experts on Food Security and Nutrition (HLPE) provides expert advice to guide food security policy formation. The CFS and the HLPE provide evidence that can be used by member governments in national strategies and policies.
Arctic Council	The Arctic Council's Sustainable Development Working Group (SDWG) produces research and deliverables related to nutrition and interventions to mitigate northern food insecurity, such as the *Circumpolar Nutrition Guide* (Jeppesen *et al.*, 2011), *EALAT: Reindeer herding, traditional knowledge, adaptation to climate change and loss of grazing land* (Magga *et al.*, n.d.), and *Survey of Living Conditions in the Arctic* (SLiCA) (Andersen *et al.*, 2002). The SDWG's Arctic Human Health Expert Group also prioritizes northern food security. In addition, research through the Arctic Council's Arctic Monitoring and Assessment Programme investigates the link between environmental chemicals, traditional/country food, human health, and food security.
International Arctic Science Committee (IASC)	This non-governmental and international scientific organization's mission is to facilitate cooperation in all areas of Arctic research, across all countries engaged in Arctic research, in all Arctic regions. The IASC initiates and coordinates circumpolar scientific activities, provides independent science advice and communicates information to the public, and promotes open data and knowledge sharing and bipolar cooperation.
Alaska Food Policy Council (AFPC)	The AFPC provides recommendations and information about comprehensive policies to improve Alaska's food systems, with a focus on health, self-reliance, and prosperity (AFPC, 2012). It is a hub for food security research and policy, food and health resources, local food producers and distributors, traditional food information, agricultural education and agencies, and gardening resources.
Alaska Food Coalition (AFC)	In partnership with the State Department of Health and Social Services, the 81 agencies of the AFC aim to strengthen and coordinate public and private food and nutrition assistance programs in Alaska through mini-grants, research, sharing of best practices, collaboration, and outreach. Their series of white papers on food security issues, such as *Community Gardens, Teaching Nutrition and Budgeting Skills,* and *Wild Game Food Donation and Recovery*, are useful resources (AFC, 2013).

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Organization	Approach
University of the Arctic's (UArctic) Thematic Network on Northern Food Security	With over 130 member institutions in the eight Arctic countries and beyond, UArctic is one of the world's largest education and research networks. UArctic's Thematic Network on Northern Food Security uses a holistic approach to promote food security and self-sufficiency among northern communities. The Network focuses on outreach and engagement as well as on academic programming.
Research Institutes	Several major circumpolar research institutes incorporate traditional knowledge and participatory research methods into food security and research of Indigenous issues, such as the Alaska Native Knowledge Network at the University of Alaska, Fairbanks, United States; the Arctic Indigenous Peoples and Saami Research Office at the University of Lapland's Arctic Centre, Finland; the Centre for Saami Research, or *Vaartoe*, at Umeå University, Sweden; and the Centre for Saami Studies at the University of Tromsø, Norway.
Circumpolar Agricultural Association (CAA)	Founded in 1995, the CAA is a non-governmental organization focused on northern agricultural science and policy. Its goals are to organize annual conferences and share research and technology related to northern agriculture and rural development.

The Inuit Circumpolar Council (2012) suggests that a clearinghouse facility to organize and share existing research and evaluations is an essential component of future work to improve health outcomes of Inuit and other Arctic Indigenous peoples.

On the international landscape, the UNCFS has conducted research on how social protection mechanisms[43] protect and promote food security (HLPE, 2012). According to the CFS, effective social safety nets, including social insurance, social assistance, and social inclusion efforts, are shown to reduce vulnerability to poverty, hunger, and food insecurity. Food security and social protection are both essential for achieving the objectives of economic growth and human development (HLPE, 2012). WHO (2001) stresses the need for countries to develop food and nutrition policies that "protect and promote health and reduce the burden of food-related disease, while contributing to socioeconomic development and a sustainable environment." It presents three inter-related strategies for states to consider, including a food safety strategy, a nutrition strategy, and a food security strategy. Close coordination and collaboration among the stakeholders involved in a comprehensive food and nutrition policy are essential to optimal outcomes (WHO, 2001). For example, in developing its Zero Hunger strategy, Brazil has pioneered some innovative inter-sectoral approaches to increase food

43 Social protection consists of policies and programs designed to reduce poverty and vulnerability by promoting efficient labour markets, diminishing people's exposure to risks, and enhancing their capacities to manage economic and social risks such as unemployment, exclusion, sickness, disability, and old age (HLPE, 2012).

security (Rocha, 2009; Arnold, 2011; HLPE, 2012). The Panel felt that two of the programs integrating the Zero Hunger strategy, the Food Acquisition Program and the School Meals Program, could be of some relevance for northern Canada.

The Food Acquisition Program was developed to support local production and the commercialization of food produced by smallholder farmers. The program provides public funding for the purchase of food produced by local family farms, which is simultaneously donated to government programs such as school meals, subsidized restaurants, community kitchens and food banks, as well as to charitable organizations (community child-care centres and nursing homes, hospitals, homeless shelters, etc.).

The School Meals Program requires all public schools throughout the country to provide meals to cover at least 15% of the caloric daily requirements for children. In 2009 legislation was passed requiring at least 30% of the funding for the national school meals program to be spent on food from family farms.

Together, these programs are innovative for creating new institutional markets for food produced by small-scale farmers, and for being part of a government strategy to link food policy, poverty alleviation, food security, and health promotion. Favouring the supply of fresh vegetables and fruit from family farmers, the federal initiative is aimed at increasing the availability of healthy food for children in the public school system, supporting local economies and local food habits, and alleviating poverty among smallholder farmers. These programs also require collaboration between federal, regional, and municipal governments, through the interaction of many sectors including agrarian development, health, education, and social development.

While the geographies and the socio-economic conditions are quite different in the two countries, the Panel suggests the Brazilian experience could inspire the development of inter-sectoral initiatives in northern Canada. The Panel visualized support provided to the production of traditional/country and local food, which would then be made available to schools in northern Canada. Besides contributing to a healthy diet for northern Canada's children, such an initiative would likely contribute to local economies and the preservation of northern food habits and traditions.

In another example, a program to improve food security and nutrition using a successful multi-sectoral approach was implemented in Pohnpei, Federated States of Micronesia. The Island Food Community of Pohnpei (IFCP) coordinated representatives from the Pohnpei State Departments of Health, Education, and Land and Natural Resources, the Offices of Economic Affairs and Social

Affairs, the College of Micronesia and the Cooperative Extension Services, the U.S. Department of Agriculture's Natural Resources Conservation Service, the Conservation Society of Pohnpei, and Peace Corps Micronesia. Agriculture experts from the local area were included in discussions and programs, and other partners included radio, cable television, local press, and local businesses. Through the IFCP, community leaders were engaged to contribute to the planning of an intervention to improve local traditional food production and food security. Many mass media presentations were given, and print and promotional materials were prepared and distributed, particularly to schools and women's groups. A full discussion of the activities and materials is given in Englberger *et al.*, 2013.

Project evaluation conducted in the community of Mand in the state of Pohnpei revealed a significant increase in the use of local traditional staple crops and reduction in rice consumption, and increased use of local banana varieties and vegetables. There was increased intake of local food diversity and provitamin A carotenoid. Importantly, the community demonstrated through interviews a positive change in attitudes towards local food. This project also created interest and requests for training to implement similar activities in other island nations in the Pacific region (Englberger *et al.*, 2013).

International data show success in improving population nutrition when several sectors of government are engaged to consider nutrition-sensitive programs. The Panel observed that, based on the evidence reviewed for this assessment, it is clear that food insecurity is a multi-sectoral problem, and it follows that it requires multi-sectoral solutions. While the immediate and underlying causes of poor nutrition and health are generally a result of factors that can be placed in the home and community context, these causes are exacerbated by external forces such as climate change, lack of community access to food, lack of basic sanitation and health services, lack of effective social safety nets, and lack of education — particularly for women — on healthy food and family diets. The basic causes of food insecurity are, however, rooted in political, economic, and institutional governance and stewardship, which include environmental protection, trade issues, and operations of the private sector in food provisioning. It is therefore important for all relevant sectors to use a food security lens when establishing new programs and policies (WB, 2013).

10.2.1 Promising Practices from the Circumpolar Region

A review of circumpolar health initiatives conducted by the Inuit Circumpolar Council (Canada) shows that 19% of the 284 best practices for improving Inuit health across Canada, Greenland, Alaska, and Chukotka (Russia) are related to food security, indicating the importance of the topic (ICC, 2012).

While some of these are informative to Canada, it is essential to consider the context-specific factors defined in the conceptual framework when reviewing comparative examples. In addition to unique economic, environmental, and legal contexts, for example, individual communities and cultures have their own knowledge bases about holistic health and the symbolic and cultural value of food (Kuhnlein, 2013). With this in mind, it is still informative to examine practices to mitigate food insecurity in other circumpolar regions.

Some practices span circumpolar countries. About 70,000 Saami live in *Sápmi,* or Saamiland, which includes the Kola Peninsula in Russia as well as northern regions of Finland, Sweden, and Norway. Almost 10,000 Saami are involved in reindeer husbandry, which remains an important part of people's livelihoods (SP & GS, 2005). In an effort to support traditional ways of life, local economies, and knowledge sharing among younger generations, the Arctic Council project EALLIN: Reindeer Herding and Youth brings together Indigenous reindeer-herding youth from across Russia, Scandinavia, and Mongolia to share their experiences (ICRH, 2013). The program focuses on local capacity building, the use of new technologies and multimedia initiatives, networking, and dialogue between herders and industry (ICRH, 2013).

Programs at national levels also illustrate promising practices. Finland, for example, was the first country in the world to serve free school meals (FNBE, 2008). To help promote nutrition education and increase consumption of healthy food at a young age, Finland's *Basic Education Act* states that all pupils must be provided with supervised and balanced free meals every day. Meals account for 8% of all costs of education, which are funded through the Finnish National Board of Education (FNBE, 2008). Education is a provincial responsibility in Canada, but this established national initiative represents an example that Canadians can look to for lessons and outcomes.

The Wild Game Salvage Program of the Food Bank of Alaska provides thousands of pounds of protein for clients. Hunters fill out a transfer-of-possession form and leave their harvest with one of the Food Bank's air cargo partners or at one of a selection of processing plants. The processed meat is then distributed through the Food Bank's network of non-profits (FBA, n.d.). In another example, the Alaska Native Fund provides annual grants to qualifying Alaska Native non-profit organizations and individuals who aim to sustain traditional ways of life. It is an initiative of the Alaska Conservation Foundation and the Alaska Native Steering Committee. Nine grants for projects that focus on Indigenous environmental priorities critical to food security issues in Alaska were awarded in 2013, such as How to Access Food Security from an Inuit Perspective: Building a Framework for Food Security in the Alaskan Arctic

(Inuit Circumpolar Council); the Northern Bering Sea Initiative (Bering Sea Elders Group); the Tribal Food Security and Economic Development Capacity Building Project (Wragnell Cooperative Association); and Tribal Diplomacy for Food Security (Nulato Tribe) (ACF, 2013). Thornton (2001) reflects on lessons about subsistence that northern Indigenous communities can learn from Alaska, including the need to recognize the integral nature of subsistence to Aboriginal communities and the leading role that Aboriginal communities must take in defining their own needs.

A challenge in identifying which practices to implement was articulated by the Inuit Circumpolar Council (Canada) in its review of health practices and research in Canada, Greenland, Alaska, and Chukotka (Russia): "Without precise sound evidence relevant to the specific health challenges and issues confronted by Inuit across the Arctic, there will be a persistent disconnect between the programs and practices implemented and current and emerging health challenges for Inuit and Arctic Indigenous Peoples more broadly" (ICC, 2012). While many models and programs to promote food security already exist, and while opportunities abound for innovation in future initiatives, more research and evaluation are required to drive appropriate responses to food insecurity in northern Canada.

10.2.2 Lessons in Food Marketing from Greenland (*Kalaallit Nunaat*)

Kalaaliminerniarfiit, or open-air food markets, have been operating in Greenland for 150 years (Minogue, 2005) (see Figure 10.2). They are present in most communities, where they are maintained by local governments, and prices are set by the association of hunters and fishers. As of 2011, there were about 2,100 full-time professional harvesters in Greenland, representing about 7% of the total workforce (Government of Greenland, 2012). Licensed professionals may sell their harvests commercially to local institutions, country food markets, and any of four government-controlled processing plants. There are restrictions on how and where the 5,500 "leisure time" hunters, who mostly hunt and fish for their families and friends, may sell their harvests (Government of Greenland, 2012).

Greenland has a substantial food processing sector (largely based on the fishing industry). The sector is promoted by government policy, which requires some processing industries to create jobs in local communities (Rasmussen *et al.*, 2008). The publicly owned company *Neqi,* for example, slaughters about 25,000 local animals annually (mostly sheep), and the marketing of regional food products benefits from a formal sales system.

Courtesy of Kue Young

Figure 10.2
Country Food Market, Greenland

Once processed, country food is shipped to Nuuk for distribution throughout Greenland, with 60 to 65% of all products sold to Home Rule-owned retail stores, and the remainder sold to other private retail outlets for resale. Country food prices have been reported as lower than those of imported food, such as $6 per kilo of whale meat versus $10 per kilo of hamburger meat in the 1990s (Marquardt & Caulfield, 1996). Greenland's system for producing, distributing, and exchanging country food at local markets is intended to help facilitate sustainable community development. By supporting this system, the Home Rule government reduces the need for imports, promotes Indigenous hunting practices (particularly in outlying settlements), offsets the need for government subsidies to smaller settlements, and encourages consumption of nutritious and culturally valued food (Marquardt & Caulfield, 1996).

Rasmussen *et al.* (2008) observed that these economic activities are important in all settlement types, but because hunters and fishers tend to export their products to larger Greenlandic towns, local markets are especially important to maintaining food security in mid-size settlements (communities). The history of Greenland's system for marketing country food highlights some issues that may influence the contribution of country food to sustainable community development in the Arctic (Marquardt & Caulfield, 1996).

Several aspects of the Greenlandic system hold relevance for Canada in particular. Commercial access to sustainable country food was identified as a priority topic at the 2013 Nunavut Food Security Symposium. In particular, partners from across the territory were interested in clarifying inspection requirements to make country food available in stores at affordable prices; improving community-based infrastructure to provide hunters with places to store, prepare, share, and

market their harvests; exploring ways to ensure hunters can be compensated for providing food for the community, thus redirecting current food exports to local markets; and ensuring that traditional sharing is also supported (NFSS, 2013). These issues are not limited to Nunavut. The Panel noted that a first step in applying the Greenland experience to Canada may include revisiting requirements set by the Canadian Food Inspection Agency, which regulates the federal inspection of meat products. Some conditions for the processing, transportation, and sale of fish and meat products have been identified as barriers to food sovereignty and food security in remote and northern communities (NFSS, 2013), with the result that some food that is actually "available" cannot be "accessible" to consumers (see Islam *et al.*, 2011). In Canada, Iqaluit's country food market (Project Nunavut, 2013) and Yellowknife's farmers' market (Francoeur, 2013) represent two examples of initiatives to promote locally harvested food directly to consumers in the community. Country food stores have also existed through HTOs and HFTAs.

10.3 CONCLUSIONS

While there are many similarities across northern Canada and the circumpolar region, geographic, cultural, environmental, and economic diversity necessitates programs and policies that are responsive to locally identified needs and are enabled by traditional knowledge. Communities are a key source of resilience and innovative ideas and must be included in creating the solutions that will improve food security. Each of the interventions described in this chapter has been identified as important to mitigating food insecurity; however, there is no single solution to "solving" food insecurity issues in the North. Instead, a range of holistic approaches is required, including support for local food systems and economic development strategies. Inter-sectoral cooperation among communities, local agencies, government, businesses, and institutions is an important component of successful strategies. Addressing food insecurity in the North is a complex challenge that touches on governance and food sovereignty, on poverty and economic development, and on self-determination and education. Several channels already exist in these different areas, and represent important resources for current and future research and policy development related to food security and northern Aboriginal peoples. Health and wellness outcomes can be improved if everyone works together to create responsive and appropriate programs and policies. Adequate funding and evaluation are key elements of these endeavours.

11

Conclusions

- Responding to the Charge
- Responding to the Sub-Questions
- Final Reflections

11 Conclusions

The Panel's charge was to look at the state of knowledge of the factors influencing food security in the Canadian North. This final chapter synthesizes the Panel's answers to the main question and the five sub-questions that make up the charge. The answers emerged from Panel deliberations and examination of a wide body of evidence, including traditional knowledge. Panel members also relied on the outcomes of their extensive collaborative work with Aboriginal peoples in the North.

11.1 RESPONDING TO THE CHARGE

While early definitions of "food security" concentrated on the supply of food, the definition today encompasses *nutrition*, along with *access, availability, use,* and *stability,* along with *acceptability, quality,* and *adequacy*. These terms are particularly important in the context of Aboriginal communities whose traditional diets are guided to a large extent by cultural factors rooted in traditional ways of living. In its research and deliberations, the Panel sought the most appropriate way to respond to the charge and to ensure that the concepts of food security, food sovereignty, nutrition security, and the right to food were explored as part of its response.

Main question:

What is the state of knowledge of the factors influencing food security in the Canadian North and the health implications of food insecurity for northern Aboriginal populations?

The Panel found that a diverse, multidisciplinary body of knowledge exists on food security and northern Aboriginal health. This scholarship has sprung from understanding that the causes and effects of food security are linked to a wide range of factors, and that they need examination at the individual, local, regional, national, and international levels. This knowledge base also recognizes that the drivers of, and barriers to, food security in northern Canada are multidimensional.

The Panel's research revealed the current focus of many government and non-government bodies on the issues of right to food, food sovereignty, and food security. It also underlined the prominence given by UN agencies to

charters, policies, and frameworks that underscore the right of all people to food and nutrition security — most of which are highly relevant to the situation of Aboriginal peoples in the Canadian North.

The broad body of research the Panel examined for this assessment included academic scholarship, government documents, data and reports from Aboriginal organizations, NGOs, and non-profits, and documents from international bodies. Although this research and knowledge helped to answer the questions of the charge about factors that influence food security, as well as the outcomes of food insecurity, many questions and gaps remain.

The Panel concluded, through a deliberate and careful examination of these sources, that there is a food security crisis in northern Canada. This crisis, which is more evident in Aboriginal populations, has long-term implications for the health and well-being of these communities. Northern Aboriginal peoples in Canada have rates of food insecurity well above those of the national Canadian average. Children and women are more vulnerable to food insecurity.

11.1.1 Health Implications of Food Insecurity

The Panel concluded that one of the key issues for food security in northern Canada is the continuation, and possibly acceleration, of the current trend in declining consumption of traditional/country food and an uptake in consumption of imported/market food. The proportion of carbohydrates and processed fats consumed relative to proteins is increasing. Health and wellness are affected by this nutrition transition. The imported food diet is associated with increasing rates of chronic diseases such as type 2 diabetes, poor oral hygiene, obesity, and, recently, an increase in cardiovascular disease.

The Panel also found that health and community well-being can be either an enabler of or a barrier to food security, as well as an outcome of being food secure. Communities with strong intergenerational and cultural well-being are more food secure. Food insecurity is also linked to mental health outcomes. The greatest economic manifestation of food insecurity is poverty. When poverty coincides with high food prices, consumer choices become restricted. The logistical cost of providing food in remote locations and the reliance on air transport for year-round service make it difficult to reduce food costs, barring significant technological change. The Panel noted that the costs in human well-being and the economic effects of an emerging chronic health crisis in northern Canada as a result of food insecurity require immediate attention and an integrated approach to research and action.

11.2 RESPONDING TO THE SUB-QUESTIONS

Sub-question #1 – IMPACTS

a) How are social, environmental, economic, and cultural factors impacting food security, and the subsequent health of northern Aboriginal populations?

The Panel developed a conceptual framework to guide a more holistic approach and a fuller understanding of the relationships between the components of food security. Northern Aboriginal peoples are situated at the centre of the framework. The factors closest to the centre and on the inner wheel — culture, health, rights, and resources — are those with the most direct links to food security and food sovereignty. Each of these four factors also interacts with the factors on the outer wheel: knowledge and preferences; human rights and governance; availability, access, use, and logistics; and nutrition and food safety. The framing factors on the outside of the framework which have more indirect links — intergenerational well-being, economies, place, environmental change, colonialism, and gender — also interact with all the factors on the two wheels.

All these factors contribute to an understanding of the complexity of the answers to the questions. In particular, the Panel noted the importance of gender to food security. While women are key to the achievement of food security, they also tend to be disproportionately affected by food insecurity.

The Panel concluded that the complexity of interactions between the factors conceptualized by the framework underscores the need for a multidisciplinary approach to understanding the issues, the human impacts, and the path forward. The Panel noted that issues of access to, and availability of, traditional/country food were different from the challenges of access to, and availability of, market food imported into northern communities. With respect to the latter, pricing is a definite issue, and a large proportion of community members are faced with economic barriers to accessing this food. As a result, poverty is a significant driver of food insecurity. Further, current community social programs (e.g., food banks, soup kitchens, and social welfare) are not equipped to manage the projected increase in need due to food insecurity. Few current interventions have had long-term positive impacts on the issues related to health and food insecurity. Education is a key enabler of healthy outcomes, as is support for greater access to traditional/country food, as well as lowering the logistics cost of serving remote communities.

The North is experiencing a number of transitions that are affecting food security. The nutrition transition is enabled, in many ways, by an economic transition from a subsistence economy to a market economy. A demographic transition is occurring, in which Canada's Aboriginal population is younger and growing more quickly than the non-Aboriginal population, posing significant challenges. Educational transitions that include the valuing of cultural and traditional knowledge are also important influencers of food security. Environmental transition impacts the availability and harvesting of traditional food while, at the same time, creating more opportunities to locally produce new varieties of food.

b) Considering the interaction among these factors, what are the knowledge gaps associated with enablers and barriers to food security?

Despite the wealth of information about food security that Canadians have obtained from both scientific research and traditional knowledge, research gaps abound. The causes and outcomes of food insecurity, the mitigating factors, and the effectiveness of various interventions all lack sufficient foundational research. Synthesis of existing literature reveals several clear knowledge gaps and priority areas that can be organized thematically into seven broad categories:

- research and monitoring methodologies;
- health, wellness, and nutrition transition;
- social determinants of food security;
- supply chain costs of market food systems;
- climate change, the environment, and traditional/country food systems;
- food sovereignty and governance; and
- food security and knowledge translation.

In Canada, measures of household food insecurity have been included on national health surveys since the mid-1990s. The creation of a national food security monitoring system in 2006 presented an opportunity to address some knowledge gaps, but inclusion of food security measures on other survey platforms is required to elucidate critical policy drivers at the federal and provincial levels. Measurement inconsistencies and the use of different indicators have hindered longitudinal comparisons. The Household Food Security Survey Module was included for the first time in the 2004 CCHS, but key differences in survey methodology have resulted in estimates not directly comparable with those from the annual CCHS cycles. This speaks to the need for a standard methodology and food security indicators to allow confidence and comparability.

In general, data gaps include integrated monitoring of the abundance of harvesting, the health of key traditional/country food species, gender, and the importance of the interactions between factors shown in the conceptual framework. The Panel also had difficulty obtaining data on communities from the north of the provinces. The Panel hoped that it would have been able to obtain more comprehensive data on the Métis and First Nations communities impacted by food insecurity in the North.

Incorporating social factors into analyses of food security has advanced our understanding over the past decade. Northern communities continue to undergo a nutrition transition. Little is known about how social determinants influence, and are influenced by, these evolving food security dynamics.

Sub-question #2 – RESEARCH GAPS

a) What are the current knowledge gaps in food security as a determinant of health for northern Aboriginal populations, particularly in the areas of nutrition and environmental health?

The food security measurement methods used to date have been valuable, but their ability to respond to the complexity of the dimensions underlying food security in the northern Canadian Aboriginal context is limited. This restricts the extent to which researchers can understand the links among traditional food systems, holistic health, community health, and individual health. The Panel underlined the importance of establishing standardized and culturally appropriate methodologies to assess food security and insecurity, as well as food security indicators.

As has already been noted, while Aboriginal health data have improved in quantity and quality, data from a variety of surveys are often difficult to compare because of non-standard collection methodologies. For example, Aboriginal people living on-reserve are excluded from Statistics Canada surveys, and coverage of off-reserve Aboriginal people is limited. This creates several barriers to detailed analysis. Comparable data for different Aboriginal communities on the same issue are limited, and comparisons between communities and regions are also difficult. Further, research at both the national and local levels is needed to address gaps because of the diversity of Aboriginal peoples across the North.

Data gaps have implications for outcome measures, as well as for the extent to which researchers, communities, and policy-makers can report on and monitor food security and health indicators. A consistent picture of the situation across regions, age groups, and communities is important to deliver evidence-based public policy. One example is the variation of chronic diseases and their risk factors in the populations of northern Canada.

Most of the literature documenting the health of Aboriginal peoples is primarily epidemiological. Discussion of the social determinants of Aboriginal health that contribute to health status is limited. There is also a disconnect between the health challenges that are emerging and the programs and practices currently being administered to address the health issues of Arctic Indigenous peoples.

Beyond obtaining data sets that are comparable in quantity and quality to what are available for the majority of the Canadian population, data collection tools and standards must be adapted to be relevant to the varied realities of Aboriginal peoples in Canada. The need for culturally relevant health measures has been identified in the literature as a research gap.

There are openings for research at conceptual and analytical levels to define and increase our understanding of vulnerability and community health, and how best to measure and use these concepts in making decisions about risk management and the health of the community. The Panel agreed that the inclusion of local knowledge and informal institutions (e.g., cultural sharing networks) is important if researchers and policy-makers are to clearly understand these concepts in Aboriginal communities.

New opportunities to focus on food security, including the Aboriginal Diabetes Initiative and Nutrition North Canada, offer openings for research and evaluation. A better understanding of the specific policy shifts required to achieve food security, knowledge about what is required for these changes to happen, and the combination and order of interventions that will produce the greatest effect all represent future avenues for research. There is also a need to determine how to better track Aboriginal food security issues (e.g., traditional food, food sharing), while accounting for the social variables of culture, geographic location, gender, and age.

Given the diversity of Aboriginal peoples, research to address the gaps should take place at both the national and local levels to reflect the realities of different communities. While comparative research from other jurisdictions is useful,

local contexts play an important role in shaping challenges and opportunities. Canadian research is imperative for laying the empirical foundation for effective interventions in the Canadian North.

11.2.1 Nutrition and Food Choice

Food choices, for example, are connected to the changing socio-cultural, environmental, geographical, and political realities of a place. However, less is known about how and why certain social factors, as understood beyond self-reported survey material, influence individual food choices. As highlighted in Chapter 7, although inadequate food education could act as a barrier to acquiring healthy food, interventions aimed exclusively at food education miss other important factors of influence, including issues related to one's environment, life experiences, beliefs, and habits. Most studies of dietary intake in Aboriginal communities do not aim to examine the determinants of food intake *per se*, even though many describe differences in food intake across genders, age groups, seasons, and sometimes communities, and may describe factors that could have an effect on food consumption (e.g., employment status, level of education, household size, presence of a hunter/trapper/fisher, occupation, or main source of income). For these reasons, many gaps in knowledge concern the determinants of healthy eating in Aboriginal peoples. Further studies dealing with these issues could help to inform education and subsidy programs, and shed light on the complex interactions underlying food access and choice.

11.2.2 Environmental Health

The environmental changes occurring in the Arctic as a result of climate change include changes in weather (precipitation, snow cover, fog), as well as sea-ice loss, which appear to be contributing to changes in the migration patterns and population health of wildlife, along with the introduction of new and invasive species. These changes are impacting the availability, quality, and accessibility of traditional/country food subsistence species. The outcomes of these impacts, which have both negative and positive aspects, require further investigation and study to determine the immediate and longer-term implications to human physical and mental health. Further, comparable data are lacking on seasonal food and nutrition insecurity, particularly as related to changing availability of wildlife animals and plants used as food as a result of climate change. The Panel noted the importance of sustained, systematic temporal and spatial monitoring to effectively assess the health of subsistence food species.

Continued development of quantitative risk/benefit assessments that compare total tolerable daily intakes from contaminant exposure in traditional/country food with the food's nutritional benefits would add important data for researchers. In the same vein, the Panel noted the importance of continued monitoring of

transport of and exposure to legacy, new, and emerging contaminants in the food system in the North, as well as the potential impacts of climate change. While it is costly to measure the health impacts of long-term chronic exposure to contaminants (e.g., POPs and mercury) in traditional/country food, at the same time, it is vital to continue the current cohort studies that are providing evidence of cognitive impacts of high levels of mercury, as well as potential immunological impairments. Finding links between contaminant exposure and health impacts through epidemiological studies is a complex process, but necessary to better protect the population by providing evidence-based healthy food advisories.

Gaps exist in biodiversity monitoring at the global level and in Canada, limiting the ability of researchers to predict future trends. Trend data for most High Arctic species are available for only a few selected populations, and there is often considerable uncertainty around population estimates. Furthermore, population monitoring is often done with data on species that are associated with one another (e.g., prey, predators, and competitors); habitats; and other environmental conditions.

Despite a growing knowledge base covering zoonotic diseases in the Canadian Arctic, more extensive monitoring of zoonoses and wildlife diseases (particularly viruses and bacteria) is required to produce baseline data. These data would enable researchers to differentiate between emerging and re-emerging diseases, complete food safety risk assessments, and develop culturally adapted prevention measures. While research on contaminants, nutrition, and traditional/country food has resulted in evidence-based health recommendations among Inuit populations, equivalent information on zoonoses across the Canadian North is limited, as is wildlife disease surveillance in Canada. Some zoonotic infections could increase if this knowledge gap continues to be overlooked and not addressed.

Most research tends to focus on the effects of environmental change on people, plants, and animals, or the physical environment, but not the collective interactions that shape socio-ecological systems. For example, researchers have identified knowledge gaps and methods that could be used to clarify the relationships between environmental change, food security, vulnerability, and the capacity to adapt in northern Aboriginal communities. To address knowledge gaps and research challenges, ArcticNet has developed four Integrated Regional Impact Studies, each of which underpins an Integrated Regional Impact Assessment that corresponds to one of the main political/physiographic/oceanographic regions of the coastal Canadian Arctic.

11.2.3 Environmental Change

More systematic research is needed on the impacts of climate change on food security in the North and elsewhere in Canada, including community-based assessments. Innovative approaches to health, food security, and climate assessments are needed and should consider the role of socio-cultural diversity in Arctic communities. This requires both qualitative and quantitative data and the collection of long-term data sets on standard health outcomes at comparable temporal and spatial levels. These data must include local observations and knowledge and be collected using reliable and standardized methods, including integrated, interdisciplinary approaches.

Further understanding is required of the interconnected relationships among local, regional, and national levels of governance that support and facilitate action on climate change, food security, and health. This suggests a need for data at multiple levels and research that links scales. For example, the collection of fine-scale meteorological data, which are required in many northern regions, needs to allow for the data to be linked to existing and future health data sets, so as to show connections with climatic change and health.

Quality, comparable, and standardized data sets are required to link models of northern environmental change and impact with currently used global change scenarios. As well, more research is needed to develop comparable health statistics for key health outcomes related to climate change. The ability to assess human vulnerability to climate change is greatly diminished as a result of limited and inconsistent data collection at regional and local scales.

Historical data (climate, health, social, economic) from appropriate locations with climate systems similar to those projected for Canadian northern regions must be used for integrated and geographic analyses of the spread of disease relative to climate variables. These analyses would make efficient use of existing information and increase our understanding of these issues and their interconnected nature. The development and improvement of regional scenarios are needed for areas projected to experience significant climatic impacts, such as the western Arctic.

Regional risk assessments are required to adequately assess the relative importance of certain climate exposures to human populations; impact and adaptation studies among the northern non-Aboriginal population; local-scale health vulnerability studies, including the relative importance of key socio-economic factors in adoption of adaptations or health protection measures; documentation and assessment of individual and collective health adaptations to climate and

environmental change; improvement of regional-scale climate scenarios and models for use in health impact assessments; and integrated human, biophysical, and local- and regional-scale natural system climate studies.

b) What are these knowledge gaps in the context of store-bought and country food?

With regard to traditional/country food, harvesting studies in Canada tend to be dated, and their coverage in terms of species, region, and time is limited. Due to the lack of longitudinal data, minimal needs levels are most often based on harvest "snapshots" that may fail to reflect the complexity and variability of Aboriginal resource use over time. The relationship between hunting effort and harvesting levels is mostly unknown, and minimal effort has been directed to finding out how much of the harvested food is actually consumed by people. Further, harvest studies have often neglected to fully acknowledge the structural barriers and enablers that influence harvesting. The general shortage of representative studies, coupled with the diversity in the quality and methods used, leaves key questions unanswered. Answers to these questions are essential to inform more effective policies for the future.

There are many questions about access to adequate amounts of acceptable market food. The Panel found little information in the open literature that considers the types and quantities of imported food sold; the impact of pricing on choice of nutritious versus high-carbohydrate, refined carbohydrate, and high-fat food; the marketing of such food in the North; and the profit margins of the northern retailers from food sales before and after the implementation of Nutrition North. Little peer-reviewed research exists on the impact of poverty on imported food choice in northern Aboriginal communities, but the Panel underlined the existence of grey literature that links economic status and food choice.

As has been pointed out in Chapter 6, many questions remain about access to adequate amounts of acceptable market food. More information is required about how food insecurity affects food selection given the traditions of obligation, sharing, and reciprocity inherent in many Aboriginal cultures. The requirement for education on the healthy preparation of market food has also been described as a knowledge gap in communities.

In addition, there are knowledge gaps regarding some of the logistical challenges of transportation and storage of market food in northern Canada. For example, more understanding is needed of the implications and costs

involved in establishing permanent or semi-permanent public infrastructure (e.g., roads) and warehousing (e.g., storage and retail structures). How these challenges affect food prices is not always clearly understood, and the options are not always practical, affordable, or currently available (e.g., potentially less expensive and more efficient modes of food shipping through innovations in airship technology). There is a need for additional research in this vein. The Panel noted that knowledge on the infrastructure costs of providing market food in northern communities may provide for more efficient market food delivery systems.

The nutrition transition associated with the shift from traditional/country food to market food highlights the rapidly changing modes of accessing food as well as the broader complexities of the mixed economy. Because the transition is in progress, with variation by community and region, less is known about the future implications for communities, families, and individuals, or what other interlinking social, economic, and environmental factors will influence food insecurity in the North. Although the Panel acknowledged that research on this issue has improved, further research is required to reveal the health implications associated with the nutrition transition, including the relationships between increasing levels of chronic diseases and dietary change. The Panel was reluctant to draw direct causal effects between the nutrition transition and health in some cases (e.g., chronic diseases like tuberculosis, for which cases are rising). Diabetes and obesity, on the other hand, have clearer links to the consumption of food with lower nutritional value. The traditionally lower rates of cardiac and vascular diseases seen in northern Aboriginal populations, due in part to the protective value of consuming omega-3 fatty acids from a diet rich in marine mammal fat and to a more active lifestyle, are also changing. The long-term health outcomes from a variety of changes, including the nutrition transition, require further investigation to determine cost-value interventions.

c) What is known about the relationship between country/traditional food and food security, for example, the use and importance of traditional foods, harvesting practices and resources to support these, food sharing systems, marketing systems, and their contribution to food security among northern Aboriginal populations?

The Panel found that in northern Aboriginal communities, food connects people to land and the broader aspects of life. Traditional/country food is a cultural strength, integral to social and cultural well-being and to the economic lives of individuals and communities. The harvesting, processing, and consumption of traditional/country food provide benefits beyond nutrition, and are, for

Aboriginal people, deeply connected to community ethics of respect and identity. Although harvest and consumption of traditional/country food species are generally declining, they nonetheless provide a significant portion of dietary vitamins, minerals, and protein. Thus, the significance of traditional/country food for nutritional health must also not be undervalued.

The Panel observed that fish and wildlife harvest levels are declining in most northern regions. In some communities professional hunters are providing traditional/country food for personal household consumption, community freezers, customary sharing, and commercial sale. Some super harvesters provide 70% of all traditional/country food, while the remaining harvesters provide 30%.

Community strengths, such as traditional knowledge skills, contribute to food security and to the well-being and health of communities and individuals. For generations, traditional food practices such as food sharing networks have promoted community wellness, food security, and health. Food sharing networks remain strong, though the practices are changing. These networks are affected by changing cultural and social norms; the mixed economies of the North; the shift to market food; the increasing costs of traditional/country food harvesting; and pressures associated with climate change, contaminants, and wildlife availability and health.

The Panel noted the efforts to make traditional/country food available and affordable in local stores through subsidization and commercialization initiatives. In some cases, food safety and inspection provisions are being amended to facilitate this process without compromising health and safety. The Panel questioned how this might affect food sharing and other practices designed to ensure greater community access to this food.

There are also knowledge gaps in the commoditization of traditional/country food, including how wild food can be made available in local stores at affordable prices. Limited literature exists on the marketing of traditional/country food, and there are many opportunities for the development of further research questions in this area (e.g., opportunities to sell locally harvested food to community-based programs and facilities). These could focus on the cost of traditional/country food compared with the cost of market food in various parts of the country, and on how these costs compare considering nutrient density. Other avenues for future research could include:

- identifying the resource limits of country food products;
- investigating how Hunter Support Programs could be expanded;

- determining the extent to which the ability to sell country food could enable harvesters to continue with their chosen form of livelihood;
- examining whether the presence of a country food store in a community improves the nutrition and health of its residents;
- determining employment and income benefits from country food stores; and
- calculating how much money communities could save by increasing local food supplies and decreasing reliance on imported food.

Finally, while food sharing has the potential to alleviate food insecurity, research is not clear regarding the extent to which food sharing mitigates food insecurity, or the conditions under which sharing practices flourish or deteriorate (e.g., rural and urban contexts, or food sharing and First Nations and Métis communities).

In response to the data and research limitations outlined in the report, the Panel agreed with the literature that calls for a more nuanced understanding of the unique realities of northern Aboriginal peoples. This same literature also suggests that research agendas should be driven by the community being researched. The Panel agreed that continuing development of local research capacities is beneficial not only to increase communities' knowledge and understanding of their issues, but also to engage them in finding local solutions to issues they may know intimately. Further, a knowledge gap often exists in how collected information is used. The process of including local communities in discussions about how data are used is not generally considered in the initial stages of research design and data collection. Developing local and regional capacities to collect and use data enables communities and regionally based governments to make decisions and develop policy. Assessments that take a multidisciplinary approach by considering demographic, socio-economic, and health and environmental data are required to develop an adequate understanding of impacts, vulnerabilities, and capabilities in northern Aboriginal communities.

The Panel also stressed the importance of more local ownership in research processes and suggested that local research capacities need to be given more attention. The development of local research capacities and the increasing attention given to community-driven research initiatives have been noted to have positive implications that go beyond the quantity and quality of data. Investing in local capacity supports the broader socio-political right of the many northern Aboriginal communities to self-determination.

d) What are effective ways to promote country/traditional food consumption, especially among youth, taking into consideration nutrition education, skills development and approaches to knowledge exchange (e.g., intergenerational; use of technologies)?

The Panel noted that several promising initiatives have yet to be evaluated or are currently undergoing evaluations. Harvester/hunter support programs are an example of a strategy to ensure that vulnerable community members have access to traditional/country food via food sharing or community freezers. The commercialization of traditional/country food in Greenland has been determined to be a main factor in the high rates of such food consumption among that country's population (Indigenous and non-Indigenous). In addition, the Panel noted those initiatives that increase accessibility of harvesting tools (e.g., guns, ammunition, and snow machines) and promote safe harvesting (e.g., ice monitoring, weather forecasting, and GPS) as ways to promote access to, and consumption of, traditional/country food. Initiatives to promote local food production through greenhouses are also providing nutritious but limited food in northern Canadian communities.

In line with its finding about ensuring community collaboration and involvement in initiatives designed to promote traditional/country food consumption, the Panel found that local governance-related measures, such as quotas and co-management arrangements that monitor and regulate animal health, are an important component of subsistence harvesting and conservation. Community-based monitoring of populations and health of subsistence species is an important component of knowledge-based decision-making.

Despite the many practices that aim to increase local and traditional/country food consumption among youth, there is a research gap with respect to the reasons for changing youth perceptions on traditional/country food. These include on-the-land experiences, intergenerational knowledge exchange, and education about preparation of traditional/country food. Considering the connections between traditional knowledge, land skills, and food security, the Panel underscored the importance of promoting practices that encourage intergenerational knowledge transmission, which is of particular relevance to encouraging traditional/country food consumption among youth. Other practices include integrated and culturally relevant school education programs that reflect northern Aboriginal values and realities, local food growing and harvesting programs, and initiatives that empower and enable youth with knowledge and skills related to food safety and security.

Sub-question #3 – PROMISING PRACTICES

a) What is known about the evidence base that informs strategies to mitigate food insecurity among Northern Aboriginal populations?

There are many opportunities to share and learn from interventions that play a significant role in northern food security. While many models and programs to promote food security already exist, and opportunities abound for innovation in future initiatives, more research and evaluation are required to drive appropriate responses to food insecurity in northern Canada.

Recent research in Nunavut is attempting to address this. Nunavut Food Security Coalition work has shown that stable funding and dedicated human resources are also important to sustain initiatives that are designed to alleviate food insecurity. Programs designed to increase the affordability and availability of healthy food, health and education programs, community wellness and intergenerational knowledge sharing, harvester support and sustainable wildlife management programs, poverty reduction and community economic development strategies, and innovations in infrastructure, transportation, and local food production are all important components of successful mitigation strategies. Community engagement and empowerment are an important component of strategies to mitigate food insecurity. The Panel highlighted that substantial but undervalued community learning takes place when efforts are made to meaningfully engage local actors in their own analysis and perceptions of food security. The Panel agreed that advocacy is essential to ensuring community access to food. The recent formation of the Feeding My Family Facebook Group, the resulting community activism across Nunavut against high food prices, and attempts to develop community-based solutions to deal with those high prices and their consequences for people's lives provide contemporary examples of community engagement at work in northern Canada. The ongoing dialogue created by this and other social movements such as Idle No More may raise awareness and create a more active and engaged community. Can sustainable changes result from this and other community-driven initiatives, changes that will enable food security and food sovereignty?

The Panel observed that communities are a key source of resilience and innovative ideas, and must be included in creating the solutions that will build food security. Effective interventions are driven by the communities themselves. Community food assessments are an example of a tool that enables community members to identify food security and health challenges and opportunities.

Despite the well-known high rates of food insecurity in northern Canada, much less is known about informal initiatives that improve food security. As described in Chapter 10, many of these initiatives are taking place in communities, sometimes informally among families, yet a comprehensive understanding of what strategies exist, and what works and why, has not yet been reached. The resilience, creativity, and leadership present in Aboriginal communities across Canada to address pressing social and health issues are significant, but these assets are not fully understood.

There are also knowledge gaps in the integration of food security initiatives into programs aimed at reaching other social goals. For example, in literacy education, the practice of embedding literacy activities in workplace training appears to be a successful model among adult learners, especially in a northern context. Could embedding skills to promote food security, such as harvesting practices, financial literacy, or healthy food choices, be incorporated into other existing mental health, educational, or cultural programs? Several authors have recommended program alignment to integrate food security components into existing initiatives. Across the North, many popular on-the-land programs use harvesting activities to promote broader goals such as cultural revitalization, community rehabilitation, and individual and community well-being. How these holistic programs play a role in addressing food security has yet to be widely studied. Rigorous quantitative and qualitative analyses to better understand food security as an outcome of other social initiatives could provide valuable insights for future research, policy, and programming development.

Various institutional structures, including governance regimes, shape the lived realities of northern Aboriginal peoples in ways that impact their autonomy and ability to create and access conditions that would enable better health, including access to traditional lands and traditional food systems and sources. A number of programs and policies exist at various government levels to provide a policy framework for ensuring food security within a population. Yet there is minimal peer-reviewed literature that assesses the effectiveness of these programs to address food security in northern Canada against agreed-upon criteria. The Panel noted an example of a systematic analysis of current food security programs in Nunavut. However, there are relatively few standard, comparable methodologies.

The Panel noted that further investigation could reveal how governance structures at all levels could better support northern Aboriginal peoples' attainment of food sovereignty. More research is needed to determine the ideal decision-making processes and governance models that can better integrate issues of food sovereignty and health.

b) What can be learned from strategies implemented by other circumpolar countries, such as Greenland?

International initiatives can also be informative to Canada, but it is essential to consider context-specific factors. The Panel noted some interesting, successful, and illustrative international practices to mitigate food security in circumpolar regions. These included food marketing practices in Greenland in which hunters and fishers are involved, special grants for organizations whose objective is to sustain traditional ways of life, the development of school meal programs as an integral part of education and school programs, husbandry of traditional herds, and capacity building at the local level.

The Panel recognized that such illustrative practices are not all transferable to the situation in northern Canada, but noted that the most successful and sustainable of these practices involved close collaboration and partnership between local communities, researchers, governments, and local businesses.

Sub-question #4 – TRADITIONAL KNOWLEDGE

What contribution are traditional knowledge networks of northern Aboriginal communities making to food security research?

While Western scientific research on food security and northern Aboriginal health has proliferated since the mid-1990s, the Panel noted that traditional knowledge and community-based research about these topics has always existed and can be used to more fully understand and contextualize the current food security issues in northern Canada.

Traditional knowledge is a way of life, and intergenerational knowledge transmission is critical to understanding food security, food sovereignty, and the factors that influence both, such as environmental sustainability and health and wellness. The Panel noted the richness of traditional knowledge about the effects of climate change; changes in biodiversity; harvesting practices; wildlife health and behaviour; environmental and resource management; and important practices such as food safety, food preparation, and food sharing.

Several Indigenous knowledge centres, networks, programs, community-based research hubs, centres for northern research, and food security organizations actively promote the integration of traditional knowledge and Western science into northern food security research. These channels are important resources for current and future research and policy development related to food security and northern Aboriginal peoples. They also represent models from which other organizations can learn.

Sub-question #5 – INTERNATIONAL APPROACHES

What are the international approaches to developing scientific evidence and knowledge systems in support of interventions to mitigate food insecurity among northern Aboriginal populations?

An increasing number of academic research centres and programs focus on food security for northern Aboriginal populations. The Panel found that there is a commonality in both the issues studied globally and the approaches used to deal with food insecurity. For instance, there are links between chronic diseases such as obesity and diabetes and the nutritional deficiencies resulting from the nutrition transition, which has affected whole communities in the North. Efforts are increasing internationally to develop scientific evidence and knowledge in support of interventions to deal with these effects. Canadian researchers are both contributing to and learning from these efforts. Examples of organizations involved in such research include the Arctic Council, the Inuit Circumpolar Council, and the Saami Council.

The UN Committee on World Food Security has served as a useful intergovernmental forum for reviewing food security policies and monitoring the effectiveness of initiatives to reduce hunger and food insecurity. Other international efforts noted by the Panel included the use of research networks across circumpolar states and partnerships between university researchers, government agencies, Aboriginal organizations, northern community representatives, and businesses and industry. This is reflective of the type of multi-sectoral research and solutions required to deal with the issues involved with food insecurity in the North.

11.3 FINAL REFLECTIONS

The twinned issues of poverty and environmental dispossession underlie the inequities resulting in food insecurity for Indigenous peoples in the Canadian North. Improving food security requires culturally appropriate, grassroots, community-driven actions that address local needs, along with collaborative decision-making to create effective policies and programs.

A continuum of programs and policies must be used to address food insecurity, ranging from short-term mitigation to long-term, large-scale initiatives that focus on root causes. Recall that short-term strategies can include food banks, soup kitchens, and school and daycare meal programs. Medium-term solutions can encompass education efforts or hunter support subsidies. Long-term solutions refer to sustainable efforts to reduce poverty and develop northern communities, while drawing on the assets, capacity, and abilities of northern communities, as well as holistically responding to the factors that contribute to the inequities that underlie food insecurity. The Panel underlined the importance of differentiating between programs and policy responses at one end of the spectrum that aim to mitigate food insecurity in the short term, and options at the other end of the spectrum that offer long-term, sustainable solutions.

Extensive research exists on food security and northern Aboriginal health. Past research on nutrition and food insecurity related to Indigenous communities, particularly those in the North, have not always respected either the *Ethical Principles for the Conduct of Research in the North* or the *International Ethical Guidelines for Biomedical Research Involving Human Subjects*. For instance, it was revealed that known conditions of food insecurity in Indigenous communities and in residential schools were exploited to conduct experiments that did not translate into any benefits for the Aboriginal children or communities who were subjected to the research. With an improved understanding of Indigenous peoples' rights, and in response to the urgency of food insecurity among northern Aboriginal peoples, a diverse and interdisciplinary body of literature, informed and strengthened by traditional knowledge and community-based research, is rapidly expanding. However, many gaps exist in our understanding of food security, and new questions continue to emerge in the context of social, cultural, economic, political, and climate-related changes. Canada has the capacity and knowledge to address the critical issue of food insecurity experienced disproportionately by northern Aboriginal peoples. There are clear opportunities towards achieving food security and food sovereignty by using existing local, regional, national, and international knowledge, experiences, and policies, as well as in expanding the evidence base so that Aboriginal communities, researchers, policy-makers, and Northerners can create sustainable and dignified solutions to the long-standing complex challenge of food insecurity among Aboriginal peoples in the North.

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